THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal · RAILWAY RECORD.
RAILWAYS ILLUSTRATED · ESTABLISHED 1835 · Railway Official Gazette

PUBLISHED EVERY FRIDAY
AT
33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: VICTORIA 8836 (6 lines)

Annual subscription payable in advance and postage free:
British Isles and Abroad.....£2 5s. 0d.
Single Copies.....One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 63. NO. 9 FRIDAY, AUGUST 30, 1935

CONTENTS

	PAGE
Editorials	333
Letters to the Editor	338
The Scrap Heap	339
Overseas Railway Affairs	340
Railways and Road Transport Section	341
Karriers in South Africa	342
New Road Vehicle Oil Engine	343
A Transandine Link	345
Railway News Section	347
Personal	347
News Articles	349
Notes and News	350
Recent Patents Relating to Railways	352
Contracts and Tenders	354
Official Notices	355
Railway Share Market	356

GREAT WESTERN RAILWAY CENTENARY

A Special Number in connection with the Centenary of the Great Western Railway Company is presented as a Supplement with each copy of this week's issue. Extra copies of the Special Number can be obtained direct from the Publisher or through any newsagent, price 1s. *each*

Encouraging Organised Excursions

THE railways have made special efforts this year to secure a share of the business arising from the day outings undertaken during the summer by industrial concerns, schools, and associations. Not content with soliciting patronage in quarters where such excursions are known to be in view, the companies' representatives have exerted themselves to encourage one-day holidays among organisations which have previously neglected their possibilities. Expert staffs advise and assist the promoters of these functions to prepare attractive outings at cheap fares, while specially designed and equipped stock is frequently used for the conveyance of large parties who desire to take meals en route. These trips are not confined to rail journeys, as the association of the railways with road transport, river, and steamship companies enables them to offer unique facilities for rail, road and river trips, or combined rail and steamer trips, while frequently theatre or cinema performances can be included in the excursion. There are signs that, stimulated by such propaganda, the public desire for travel is increasing, and having created the demand the railways will find fresh scope for originality and salesmanship in supplying it.

Travellers Prefer Railways

It is not only the weather and the general revival in trade that have contributed to the increased passenger receipts recorded over the August Bank Holiday period this year, for travellers today can make their journeys in many ways other than by train. What the railways have reaped, therefore, is not the inevitable harvest of a monopoly but the reward of a preferred system of transport. To this preference there is no doubt that the companies' own efforts to sell passenger travel during the last year or two have in themselves made a substantial contribution. The largest proportion of passenger revenue is derived from the sale of monthly return tickets, which, because of their reasonable fare, freedom from restrictions, break of journey facilities, and interavailability have made a great appeal to the public. On commercial grounds, the companies' decision in May, 1933, to sweep away the former irksome restrictions attached to period excursion tickets has clearly been justified, although the heavy concentration of traffic which now occurs on Saturdays during the summer months has occasioned operating difficulties. To complete their record of achievement and retain their present esteem, the railways now face the harder task of keeping faith with those who have responded to their inducements by ensuring that density of traffic does not occasion deterioration of service.

* * * *

The Week's Traffics

A net decrease of £14,000 is shown in the total traffics of the four group companies together for the past week, mainly on account of the large decrease in passenger train earnings on the L.M.S.R., and because goods and coal receipts are down except on the L.N.E.R. Thanks chiefly to the large increase by the Great Western, the passenger side shows a net improvement of £6,000 by the four companies for the week. Passenger train traffics of the four companies together for the year to date amount to £45,280,000, an increase of £1,117,000 or 2·53 per cent. Total traffics for the four companies for the 34 weeks are estimated at £98,073,000, an increase of £823,000 or 0·85 per cent. Aggregate merchandise traffics show a net decrease of £17,500, as against increases of £62,000 and £52,000 respectively on the L.M.S.R. and Great Western must be set decreases of £8,000 on the L.N.E.R. and £123,500 on the Southern. Coal class traffics of the four companies together for the year to date are down £276,500.

	34th Week				Year to date.	
	Pass., &c.	Goods, &c.	Coal, &c.	Total.	Inc. or Dec.	
	£	£	£	£	£	%
L.M.S.R.	− 12,000	− 2,000	− 5,000	− 19,000	+ 452,000	+ 1·16
L.N.E.R.	+ 5,000	+ 3,000	+ 1,000	+ 9,000	+ 98,000	+ 0·34
G.W.R.	+ 14,000	− 6,000	− 3,000	+ 5,000	+ 146,000	+ 0·90
S.R.	− 1,000	− 5,000	− 3,000	− 9,000	+ 127,000	+ 0·96

* * * *

Great Britain's Only Mountain Railway

Ever since its opening on April 6, 1896, the Abt rack railway to the summit of Snowdon has held the distinction of being the only line of its kind in Great Britain. The Snowdon Mountain Tramroad & Hotels Co. Ltd. was incorporated on November 16, 1894, and the first sod of the line was turned by Miss Assheton Smith on December 15. In the following May some £63,430 was raised in ordinary shares of £10 each, although by this time considerable progress with the work had been made, as no Parliamentary powers were sought and the undertaking was thereby saved the delay of waiting for an Act. The possibilities of electric traction were at first considered,

XUM

but steam locomotives were eventually selected, and the 4¾ miles of 2 ft. 7½ in. gauge track from Llanberis to the summit have always been steam operated. The present popularity of the railway was indicated at the recent general meeting of the Snowdon Mountain Railway Limited (to which title the company changed its name in May, 1928). Mr. Henry J. MacInnes, who has succeeded to the Chair following the death on December 2 last of the late Mr. Evan R. Davies, said that for 1934 the operating profit and other receipts, after providing for depreciation, amounted to £7,985, and the net profit to £5,141. From this there fell to be deducted a full year's interest on the debentures, amounting to £1,809, thus leaving £3,331 as net profit. The directors recommended a dividend of 5 per cent. for the year. He added that the directors had decided to use the whole of the general reserve, together with a portion of the balance to the credit of profit and loss account, for writing down the leasehold premises and furniture to a nominal figure of £5,000 each, and the freehold land to £1,450.

* * * *

Overseas Railway Traffics

Compared with this time a year ago the Argentine railway exchange continues fairly favourable and for the past week averaged 17·03 pesos to the £ against an average of 17·23 for the corresponding week of 1934-35. With few exceptions, however, the traffics both in sterling and currency have been unsatisfactory for the past two weeks. The Buenos Ayres Great Southern, although showing in the 7th week an improvement of £2,694 and of 15,000 in currency, is down £3,501 and 85,000 pesos for last week. On the Buenos Ayres Western the losses during the past two weeks are £7,168 and 142,000 pesos, and on the Central Argentine are £40,149 and 744,250 pesos. During the same period, however, the Buenos Ayres & Pacific has improved its position to the extent of £3,166 and 22,000 pesos, and the Entre Rios to the extent of £3,793 and 59,600 pesos. The Canadian Pacific has during the past two weeks reduced its decrease from £50,400 to £36,800.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
		£	£	£	£
Buenos Ayres & Pacific ..	8th	71,756	+ 1,704	578,159	+ 15,492
Buenos Ayres Great Southern ..	8th	123,371	— 3,501	921,249	— 76,785
Buenos Ayres Western	8th	36,994	— 2,472	317,427	— 36,554
Central Argentine	8th	114,298	— 21,268	955,222	— 97,098
Canadian Pacific	33rd	477,600	+ 11,400	14,945,200	— 36,800
Bombay, Baroda & Central India	20th	166,950	— 375	3,076,950	— 15,075

* * * *

Pennsylvania Railroad Results

A net operating income on the Pennsylvania Railroad during 1934 of $63,331,530 represented a return of 2·34 per cent. in investment on physical property, a low figure which has been worse only on three previous years of normal working and during those when the system was under Federal control during the war. In a letter accompanying the dividend warrants—for 1 per cent., or 50 cents a share—the President reviewed the events of the year and the various calls upon the company's resources which counterbalanced gross revenues increased by $18,952,885 compared with 1933 and reaching the total of $343,668,700. This represented a gain of 5·8 per cent., which was recorded in spite of a marked falling off in freight revenue during the second half of the year, but operating expenses rose by 9·7 per cent. to $248,786,108. Since July 1, 1934, the company had restored 2½ per cent. of the 10 per cent. wage reduction in force since 1932. From August 1 to the end of the year it had also contributed $2,800,000 for pensions as required by the Railroad Retirement Act, a sum equal to 4 per cent. of all monthly wages not in excess of $300. The current year's expenditure on maintenance and new equipment is expected to be lower, but the company is sufficiently satisfied with the success of air-conditioned trains to propose extending this facility.

* * * *

U.S.A. Holidaymakers' Cars by Rail

In order to make it possible for holidaymakers to enjoy the use of their cars during their holidays without the fatigue, uncertainties, and loss of time incident to long motor drives, the Pennsylvania Railroad inaugurated several years ago a " ticketing " plan which permits the holder or holders of two railway tickets, upon the purchase of an additional ticket, to have a motorcar forwarded to any destination by expedited freight train service, assuring scheduled delivery. This special service is used chiefly to summer and winter resort points. The scheme has secured considerable popularity and more than twice as many motorcars were shipped by train under this plan during the first six months of 1935 as in the corresponding period of the previous year. From January to June inclusive of the present year 4,302 vehicles were carried, as compared with 1,986 in the previous year, an increase of 2,316 or 117 per cent. On the basis of the number of motorcars transported under this plan over the Pennsylvania Railroad lines in the first half of 1935, upward of 10,000 passengers travelled by train to and from holiday resorts, both north and south, who would otherwise in all probability have made the journey by road.

* * * *

The Netherlands Railway Museum

Any railwayman finding himself in Utrecht, the central city of the Netherlands, should not fail to visit the railway museum adjoining the Central station. Its inception was due to the initiative of the late Mr. G. W. van Vloten, an officer of the company working the original State Railways, who gathered the beginnings of the collection, soon after housed in a room provided by the management. After Mr. van Vloten's death, the collection was taken over by a trust under the auspices of the Netherlands Railways and placed in the present building, and at the same time was reorganised by the curator, Mr. H. M. Asselberghs. The official opening took place on December 1, 1928. Although a small country, Holland offers much of interest to the railway student, as there were several companies in existence in the early years. This is well illustrated in the museum by maps, plans, prints, photos, and medals, and with models and engineering details of various kinds. It is proposed to move the collection to larger premises in due course, where we trust it will be seen by an increased number of persons. We were somewhat disappointed to find so few there on the occasion of our recent visit.

* * * *

A Famous L.N.E.R. Paddle Steamer

The private chartering of the L.N.E.R. paddle steamer *Killingholme* of Grimsby on August 6 for the conveyance of the ashes for burial at sea of the late Col. Sir Benjamin Bromhead, C.B., the oldest baronet in England, who died at the age of 96, has roused considerable interest in the record of service rendered by this vessel. She was built in Earle's Yard, Hull, in 1912 and almost immediately achieved prominence, as she was used by the King and Queen for the official opening of the King George Dock, Immingham, on July 22 of that year. After this the vessel reverted to the service for which she was intended, namely, that of a ferry boat between New Holland and Victoria pier, Hull. Had it not been for the outbreak of the war the *Killingholme* might have spent the rest of her days here, but in February, 1916, she was commandeered by the Admiralty for special service. Even now the

precise nature of this service is not known, but the vessel received extensive damage to her paddles by a torpedo attack from German submarines. In November, 1918, the *Killingholme* was again on special service, this time being employed at Hull for disembarking repatriated prisoners of war. When her work in this connection was finished she reverted to the Humber Ferry service and became very well known to regular passengers between New Holland and Hull until Christmas, 1934, when, along with her sister ship the *Brocklesby*, she was replaced by the new steamers *Tattershall Castle* and *Wingfield Castle*. During this summer she has been running daily river cruises from Grimsby to Spurn, Immingham, Killingholme, Hull, Read's Island, and Burton Stather, and is fast achieving a considerable measure of popularity with visitors to Cleethorpes.

* * * *

P.L.M. Poster Advertising

Railway maps as displayed in poster form in this country are open to two criticisms; either there is nothing in them to warrant a second glance from the casual observer, or they are produced as pictures, humorous or otherwise, in which their presentation of the system becomes of secondary importance to the effect of the whole. The problem of combining art and geography in complementary proportions has been solved in a poster now being displayed by the P.L.M. Here the ramifications of the railway, boldly shown in red and with connecting systems equally prominent but in black, are shown against the background of a coloured map on which topographical features stand out as if in relief. The tints chosen for water, mountain, and valley are restrained but satisfying, and the poster is one that instantly attracts and holds the eye. An equal skill in colouring is evident in many other posters issued by the railway for the summer season. Warm and bold tints, splendidly representative of their subjects, and an economy of line proper to the poster are achieved without a hint of the self-conscious impressionism which sometimes mars experiments in this type of advertising.

* * * *

Carriage Seating

It is often said that a long railway journey is a tiring experience, and so indeed it can be. But if it is, there is an easily avoidable reason. The first essentials to the avoidance of fatigue are non-exertion, bodily comfort, and congenial surroundings. On a railway journey there should be little opportunity for exertion, and the accommodation provided for the passenger by the railway can as easily be designed to give comfort as the reverse. Yet how often are railway carriages both unattractive looking and uncomfortable? Gladly it will be admitted that, for the last few years, the general appearance, internally, of railway carriages has vastly improved, even if they are dingier than ever on the outside. But alas for the seats themselves! There is generally more elbow room, it is true; but far more important than lateral width is a seat so shaped that its recipient will repose in such comfort that he will not wish to stir at all. The scientific shaping of seats has been, and is being, lamentably neglected; yet it is a simple science. Soft cushions that do not support the average human frame where it needs it are more unrestful than wooden seats well shaped. The other day we were so lucky as to travel in coach No. 7975 of the Southern Railway. But that the seat might have been a little lower (or a footstool provided) it was ideal. Next day our journey took place in the very latest Southern coach. The seat was wider and softer, but the squab was too upright and consequently there was no proper support for the small of the back. Result: weariness where the previous day had been a feeling of rest.

The Use of Heavy Rail in U.S.A.

Steel rails produced in the United States last year totalled 1,010,224 tons. This was an increase of 593,928 tons, or 143 per cent., as compared with 1933, and 607,658 tons, or 151 per cent., as compared with 1932. While these increases are substantial, the tonnage for 1934 is still considerably below the level of rollings that prevailed in the years before the depression and compared with an output of 3,217,649 tons in the peak year of 1926. Of the total of 1,010,224 tons produced last year, 491,642 tons weighed between 100 and 120 lb. per yd., 325,942 tons weighed between 120 and 136 lb., and 31,805 tons weighed 136 lb. and over. Thus more than 800,000 tons of rails, or approximately seven-eighths of all the steel rail produced in the United States last year was of 100 lb. section or heavier. The figures quoted have been compiled by the American Iron and Steel Institute. In Great Britain no rail heavier than 100 lb. per yd. is normally used, and in 1934 the total quantity of rail used by the four main lines was just over 183,000 tons.

* * * *

Colour Control of Machine Tools

A hitherto debated point regarding Mr. G. L. Murray's system of limit gauging control by colours was cleared up by him in answering a question on his paper dealing with the subject before the Institution of Locomotive Engineers. He was asked whether it would be a longer process for a drawing office to colour blue prints than to put down the dimensions, especially in cases such as a machine base plate, which might have 30 to 40 different sizes of holes. In reply, Mr. Murray explained that for repairs selection of gauge is done by means of the coloured discs attached to the work, and the colour system operates without reference to the shop blue prints. For new work, however, it is obviously necessary to use blue prints, and in cases of this kind colours are used to define the class of fit required and to identify the jig, gauge, drill, tap or other tools concerned. Each colour is combined with a simple and characteristic shape which enables the information to get on the shop drawings by means of the ordinary blue printing or other process, and puts no extra work on the drawing office. The principles of colour control were outlined in *The Railway Engineer* of November last year.

* * * *

Preheated Air for Locomotive Fireboxes

The Lima Locomotive Works of New York have produced an air preheater for locomotive fireboxes which, it is claimed, provides uniform combustion conditions, fuel economy, an increase in evaporative efficiency, and a reduction in firebox maintenance. Under normal conditions, firebox maintenance is made more difficult and costly by cold air coming in contact with the side plates, and their consequent expansion and contraction cause warped and cracked plates, and leaky staybolts and rivets. The device referred to has been in use for about eighteen months on a modern American 2-10-4 locomotive, and in consequence leakage of staybolts and foundation ring rivets has been reduced to a minimum. The air preheater is applied in two sections, one on each side of the firebox directly below the foundation ring. These sections are comprised of casings each containing a number of finned tubes, which are located relatively close together, and staggered to provide maximum efficiency in the transfer of heat. The tubes extend lengthwise through the heater sections and terminate in tubeplates, whilst the fins are ranged in lines parallel to the general path of the air flowing through openings into the heater, whence it is discharged just below the grate. The temperature of all air is thus raised before it reaches the fire bed. Shut-off valves permit the heater to be made inoperative without interfering with running.

XUM

The G.W.R. Centenary: Travel in 1835 and 1935

TODAY the Great Western Railway Company completes a hundred years of corporate existence, for it was on August 31, 1835, that the Act of Parliament incorporating the company received the Royal Assent. In many ways the undertaking and its enterprising officers broke away from the Stephenson tradition in the earliest years, and in so doing earned the epithet unique for a variety of its features. Now, at the end of its first century, the G.W.R. finds itself as the only one of the great British railway companies to have had so long a period of unbroken corporate life. To celebrate the event the company has arranged a special broadcast programme for this evening and both Paddington and Bristol stations are decorated. Tomorrow (Saturday) a commemorative luncheon is being held in the Great Hall of Bristol University, to be followed by a presentation of the Centenary sound film specially produced by the G.W.R. Alone of the systems which passed through the period of radical alterations brought about by the Railways Act of 1921 the G.W.R. retained the privilege of continuing to use its own title, and, under its original charter, to absorb the 32 separate concerns assigned to the Western Group by that Act. To mark the centenary, we have produced a special historical number and present a copy this week to every reader. In this supplement are set out the main features of a long and eventful story which, as Sir James Milne points out in his Foreword, is a chapter in "the history of the development of the nation and the economic and social well-being of the people."

Perhaps the most vivid picture of the changes which the G.W.R. has been instrumental in bringing about in the West of England is given by the contrast between the conditions of travel obtaining in 1835 and those of today. Fortunately the early and middle years of the nineteenth century were rich in descriptive writers, and none portrayed the life of the period in its many aspects better than Charles Dickens, who was born at Portsea in 1812, or six years before Brunel, who built the Great Western Railway, first saw the light of day in that same town. It was an age of brilliant young men, for Dickens had already written his "Sketches by Boz" when twenty-one, and when he was twenty-three years of age Brunel was already known as an engineer of outstanding ability and had had his designs accepted for the beautiful suspension bridge that spans the gorge of the Avon at Clifton. Dickens lived his youth in the stage coach era, and his works abound with graphic descriptions of travel of that time; indeed, much of his delightful humour is associated with coaching ways and those who followed the calling. For the purpose of comparison of travel conditions between 1835 and 1935, we get a good example in "Pickwick Papers." Dickensians will recall that, on the second day following the trial of Bardell *v.* Pickwick, the much maligned defendant, sadly in need of a change of air and scene, departed from London with his distinguished colleagues, Messrs. Tracy Tupman, Augustus Snodgrass, and Nathaniel Winkle—not to mention the irrepressible Sam Weller—to take the waters and taste the social delights of Bath. They journeyed by the 7.30 a.m. coach from the White Horse Cellar Inn, and arrived at their destination at 7 p.m., having lunched at one of the many stopping places on the way. Registered seats and advance booking are not such a recent innovation as we may assume, for was not Sam Weller despatched overnight to the White Horse Cellar to take five places on the coach? He was successful in securing all the remaining seats for his party, which consisted of two "insides" for his venerable master and Mr. Winkle, and three "outsides" for Messrs. Snodgrass and Tupman, and himself. Here is a little picture of the coach station where the passengers started on their eleven-and-a-half hours journey:—

> The horses in the stages that were going out, and had come through the city, were smoking so, that the outside passengers were invisible. The newspaper-sellers looked moist, and smelled mouldy; the wet ran off the hats of the orange-vendors as they thrust their heads into the coach windows, and diluted the insides in a refreshing manner. The Jews with the fifty-bladed penknives shut them up in despair; the men with the pocket-books made pocket-books of them. Watch-guards and toasting-forks were alike at a discount, and pencil-cases and sponges were a drug in the market. Leaving Sam Weller to rescue the luggage from the seven or eight porters who flung themselves savagely upon it, the moment the coach stopped, and finding that they were about twenty-minutes too early, Mr. Pickwick and his friends went for shelter into the travellers' room—the last resource of human dejection.

This particular journey seems to have been more or less uneventful. Messrs. Pickwick and Winkle had as travelling companions Mr. and Mrs. Dowler, whom they had encountered in the "travellers' room" at the starting place, and we read that "between Mr. Dowler's stories, and Mrs. Dowler's charms, and Mr. Pickwick's good-humour, and Mr. Winkle's good listening, the 'insides' contrived to be very companionable all the way." All of which seems very like what might happen on a G.W.R. train journey today. "Pickwick Papers" was, of course, written for readers familiar with all the conditions of stage coach travel, and we naturally get less information about the actual journey than about the incidents which occurred at the various inns used as stopping places and for the refreshment of passengers and change of horses. Dickens and his contemporaries provide accounts of many stage coach journeys of the period, and whilst these were doubtless pleasant during fine weather, the "outsides" were certainly not to be envied when conditions were inclement. Dr. Johnson has put it on record that to travel with a pretty woman in a mail coach at the rate of six miles an hour was the most pleasing thing in existence, and doubtless the old coaching days had their delights under favourable conditions. What, however, of the outside passengers in the winter, exposed to all the fury of the elements? They must have indeed been a spartan race who endured journeys up to twenty hours on end over the rough roads of the period in fog, rain, wind or snowstorm. One writer tells us these journeys killed hundreds of people, and outside passengers were often well nigh frozen to death and could be got down from the top of the coach only in the doubled-up positions in which they had stiffened. Moreover, the dangers of stage coach travel were not all from climatic conditions, for upsets on the rough roads were not infrequent, and Dickens tells us that he had been "upset in almost every description of vehicle known in this country." But let us get back to our Pickwickians on their journey to Bath. Dickens's statement that the "outsides did as outsides always do" was probably more enlightening to readers of his day than it is to us, for it is not a little difficult to appreciate the feelings of passengers seated in cramped quarters on the top of a stage coach from 7.30 a.m. to 7.0 p.m. in days when roads were unprovided with the "billiard-table" surfaces that we know today. What does concern us, however, is the fact that "there was a dinner which would have been cheap at half-a-crown a mouth, if any moderate number of mouths could have eaten it in time," and this delightfully informative way of putting it calls for no comment or qualification.

Now let us contrast all this, which may be taken as typical of road travel a hundred years ago, with railway travel in the year of grace 1935. Had Mr. Pickwick lived today, he and his fellow members of the Pickwick Club could travel from Paddington station to Bath by

any of fourteen fast trains. Should they still desire to leave London so early they could proceed by the 7.15 a.m. train, but they would arrive (taking breakfast and not dinner in the train) at 9.42 a.m., with the whole day still before them. If there were some point in arriving at Bath at 7.0 p.m., they could travel by the 5.0 p.m. train from Paddington which takes but one minute over two hours for the journey. During the day, however, other trains would be available which cover 106¾ miles in no more than 102 minutes, or at an average speed of 62·8 miles an hour. The Pickwickians would not have had to rely upon the tractive effort of four "steaming" horses, but a steaming "steed of steel" with something in excess of two thousand horse power would haul their train without intermediate stop of any kind, if they desired. Trains with restaurant cars on which moderately priced meals may be taken in perfect comfort and at leisure and luncheons "at half-a-crown a mouth" are today available on most of the express services. Mr. Pickwick and his colleagues, who were certainly fond of travel, would doubtless be surprised at many things which happen in the year 1935, but not least of all that the Great Western Railway has no fewer than fourteen trains in its summer timetable conveying not four "insides" and twice that number of "outsides," but some hundred "all insides," which travel for considerable distances at start-to-stop speeds of 60 miles an hour or over, and one, the famous Cheltenham Flyer, with an average speed of no less than 71·3 miles an hour. Those who talk glibly and with regret about "the good old days," and tell us that the passing of the stagecoach has taken the romance out of travel, would, we think, hardly like to exchange the conditions of 1935 for those of a hundred years ago.

* * * *

Gauge Conversion

IT is a curious coincidence that the centenary day of the G.W.R.—the railway so generally associated with gauge conversion—should have been selected for an important change-over in the far East, but, as recorded in our Overseas columns on page 340, the Manchukuo authorities have chosen tomorrow to convert the Harbin-Hsinking line. The coincidence prompts a consideration of the subject in general, and of the methods adopted when traffic demands rapid work. Gauge conversion falls naturally into three main categories: (*a*) the widening of a narrow to standard gauge in any country, where traffic is light and the work can be carried out piecemeal or at any rate comparatively leisurely, and where no important engineering works are involved; (*b*) conversion where the new wider gauge necessitates considerable realignment to provide easier curves, rebuilding of bridges to take heavier loads, and possibly regrading also—at any rate a matter of extensive engineering works; and (*c*) the conversion on a main line where traffic is considerable, necessitating a complete change-over within a comparatively few hours. Of these, (*a*) conversions are probably the most frequent, but as they involve little special preparation or spectacular work they pass unnoticed. A typical and topical example of a (*b*) conversion is to be found in the Shoranur-Cochin branch of the South Indian Railway, which was recently converted from metre to 5 ft. 6 in. gauge. Very considerable realignment and bridge rebuilding was entailed and we hope to publish an illustrated description of this interesting work in an early issue of THE RAILWAY GAZETTE. Turning to category (*c*) one finds what examples there are of it, grouped in bunches, usually at long intervals in railway history. One curious thing about them is that they are almost all from a broad to a narrower standard gauge. One of the earliest gauge conversions of this kind was carried out as long ago as 1872, in May of which year the whole of the Great Western Railway from Gloucester westwards—some 188 miles of double and 38 miles of single line, or about 500 track miles including sidings—was converted from 7 ft. 0¼ in. to 4 ft. 8½ in. gauge.

But the most extensive instances occurred in the Southern States of America after the Civil War of 1861-5. Until the war there were many different gauges throughout the North American Continent, between 4 ft. and 6 ft. Though not all required for that continent, locomotives for no fewer than 57 different gauges are recorded as having been built by one American firm. In the Northern States conversion of gauge had been gradually carried out prior to the war, 4 ft. 8½ in. being accepted as the standard by all lines except the Pennsylvania, which adhered to a 4 ft. 9 in. gauge. Consequently during hostilities the North had a workable network of through lines compared with the variety of gauges in the South, in which, however, the 5-ft. gauge predominated. It is of interest to note that, contrary to popular belief, the Southern systems adopted the 5-ft. gauge, not with a view to obstructing Northern interests, but because the South Carolina, one of the earliest Southern lines, was of that gauge, and because it was considered, technically, the most suitable. The first post-war policy of standardisation in the Southern States decided in favour of the Pennsylvania 4 ft. 9 in. standard, and in consequence a very remarkable programme was prepared for the rapid conversion of between 6,000 and 7,000 miles on two days, May 31 and June 1, 1886. The lines concerned formed the balance of the Southern States lines, after the conversion of the Mobile & Ohio and Illinois Central lines which had already been converted, as a matter of fact, to 4 ft. 8½ in. The conversion of the former system, which was taken as a model for the 1886 conversion, was carried out on July 8, 1885, between 4 a.m. and 4 p.m., and the method adopted is very similar to that described in our Overseas columns, as applied to the latest of these class (*c*) conversions, which is being carried out on the Harbin-Hsinking main line of the North Manchuria Railway. Thus it came about that in a matter of three or four days—consecutive or at different times—the whole of the southern railways of the U.S.A. were converted, and on June 2, 1886, standard gauge trains were running throughout the South.

Chronologically, the next important instance of a conversion falling in category (*c*) was the well-known final conversion of the Great Western Railway, a subject that is referred to in our special G.W.R. Centenary Number issued as a supplement to THE RAILWAY GAZETTE this week. After the more gradual conversion, assisted by a three-rail mixed gauge in many sections, of nearly 1,000 miles of the Great Western system in 1891, it was decided to convert the Paddington-Penzance main line—nearly 200 miles of which remained to be changed from broad to standard gauge—on May 21 and 22, 1892. The conversion was successfully completed according to schedule. Though there have been many other important conversions subsequently, notably the Russian gauge lines in Poland, these have not been carried out under stress of traffic urgency in a matter of hours. In fact most of the Polish conversions were conducted in connection with the rebuilding of various lines in accordance with the general rehabilitation scheme mentioned in our Overseas columns, p. 340. But the latest example of rapid conversion—which prompted this *résumé*—takes place tomorrow morning in The Far East, where 150 miles of the North Manchuria (late Chinese Eastern) Railway are to be converted from

XUM

5 ft. 0 in. to 4 ft. 8½ in. gauge: the preparations for this spectacular piece of work are described on page 340. The three-hour time allowed in the schedule for the completion of this conversion sounds optimistic, but remembering the remarkable Japanese organisation which made possible the rapid change-over from screw and link to automatic couplers throughout the railways of Japan between July 1 and July 20, 1925, there seems no reason to doubt the ability of the Manchurian permanent way staff, supervised by Japanese officers and inspectors, to work to that schedule, which must have been prepared with great care and forethought for all contingencies.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

"On Time" and Better

London, August 24

To the Editor of The Railway Gazette

Sir,—Being recently in Birmingham, I decided to return via L.M.S.R. to London and also to have a sample of the running required by the 2-hour schedule over the L.M.S. metals. Arriving at New Street station in good time to admire the internal gloominess, being more used to Australian sunlight, I boarded the 2.35 p.m. express. The express was made up to eight cars, 249 tons tare and 260 tons loaded, worked by a "Baby Scot," No. 5523. Leaving Birmingham a little ahead of time, we covered the 18·9 miles to the Coventry stop in 19 min. 41 sec., an average of 57·6 m.p.h.

After waiting at Coventry for 1 min. 56 sec., we started off, only to be pulled up some 36 sec. later by some bright lad "pulling the tail." This caused quite a stir in the hearts of many (including your humble writer) and, after several mental conjectures as to the reason for the stop, it was noticed that nearly all the mechanical forces, and others, were taking a mighty big interest in some mysterious happenings which were concentrated round the rear car. After considerable activity a shirt-sleeved gent ran up to the boy friend on the 5523 and told him that he could go places and do things. As the train had been standing for 5 min. 8 sec., Danielio the Driver decided that it was right and proper to roll, as his Fireman had a date with a girl friend at Euston at 4.35 p.m., and so we started for Town. Speed rose to 60 2½ miles from start, followed by an unforeseen slack to 36. Brandon was passed at 51 and we accelerated up four miles at 1 in 660 to 63 by Holbrook troughs. Slowing for the junction, Rugby was passed at 35, and in 15 min. 03 sec. from Coventry.

Speed rose to 56 at Clifton Road box, and was sustained up 3½ miles at 1 in 370 to Kilsby tunnel. The ease through the tunnel brought speed up to 63 at the south portal, and once on the down grade our boy friend "threw away the bridle." Passing Welton at 70 speed rose to 80 approaching and 76 through Weedon; fell to 73 on the short rise through Stowe Hill tunnel. Passing Heyford South Box at 73, 72-77 was sustained to Blisworth, with 74 through the station; the 3 miles at 1 in 330 to Roade was approached at 73 and topped at 64, with 70 through Roade station.

The descent to Castlethorpe produced 80 and the station slipped by at 77, with 70 at Wolverton. Our time for the 22·9 miles from Welton to Wolverton was 17 min. 48 sec., or an average of 77·2 m.p.h. The 2½ miles at 1 in 440 to post 48¾ was topped at 68, and the dip through Bletchley produced 69. The two miles at 1 in 660 to near Stoke Hammond box was topped at 66 and speed was eased to 64 on the 1 in 1,683 to post 41½. Passing Leighton Buzzard at 65, speed fell to 55 at the summit of the six-mile 1 in 333 grade to Tring. The other speeds were 67 at Sear's Crossing box (start of grade); 61 at Cheddington, and 58 at Tring Cutting box. Our time from Wolverton to Tring, 20·7 miles, was 19 min. 25 sec., an average of just on 64 m.p.h.

Passing Tring at 55, a fast descent was made to Willesden, with 73 at Berkhamsted; 74 at Boxmoor; 75 at King's Langley; 75 entering Watford tunnel, 77 at Watford; 73 over Bushey troughs; 75 at Hatch End and Harrow; rose to 76 at Wembley, and eased to 60 at Willesden. Passing Queen's Park at 57, and 53 at South Hampstead, speed was eased down for the cautious descent to Euston station, where we arrived at 4.33 05 p.m., after having completed the 94·0 miles from Coventry in 91 min. 10 sec., or an average of 61·9 m.p.h. The 26·3 miles from Tring to Willesden were covered in 22 min. 10 sec., or averaging 71·4 m.p.h. The 112·9 miles from Birmingham to Euston were covered in 118 min. 35 sec., with two stops (7 min. 08 sec.); the running time was 111 min. 27 sec., an average of 60·5 m.p.h. Sixty-seven miles (76-9) were covered in 56 min. 44·4 sec., an average of 70·9 m.p.h. The best mile occupied 46·0 sec., or 78·3 m.p.h. and was between posts 55½-54½. The maximum speed noted was 80·3 approaching Castlethorpe, and also at Weedon.

M. A. PARK

Enginemen's Improvement Class Conference

Crewe, August 26

To the Editor of The Railway Gazette

Sir,—As a driver who has derived much benefit by regularly reading The Railway Gazette for some years, I was pleased to note your editorial comment on the above. As one who attended the conference I can endorse your concluding remark to the effect that such a movement deserves the active support of the railway companies, for most of those present had travelled long distances, and were enthusiasts for getting the best out of the steam locomotive.

Personally, I think the railways might well follow the example of the motor manufacturers and establish a kind of school at their principal works, where all drivers should attend periodically to see the latest devices, and to learn what is expected of them. Discussion could range over a wide field, and, with an engineer in charge who is interested in, and conversant with, the running side, a valuable link would be established between the C.M.E. and his enginemen.

With so many claims for economy it is also surprising that what would prove the most fruitful is today entirely neglected—I refer to a regular engine to one or more sets of men. I fully realise the difficulties of this, but there are very many cases where, if the will existed, the way could be found.

Your reference to two runs under identical conditions, the one employing a late cut off and using 12 per cent, more coal, requires a few more details. Sometimes this is done because it ensures a better ride on a rough and run down engine, but such a school as I suggest is preferable for correcting any habitual faults among enginemen rather than an inspector on the footplate.—Yours &c.,

J. BIRCH

[The instances mentioned in Mr. Birch's last paragraph and to which we referred last week occurred on the same engine, one incorporating up-to-date refinements on different but almost identical occasions.—Ed., *R. G.*]

Jubilee Year Visitors Through Southampton.—During the month of July, 108,856 passengers were dealt with at the Southern Railway Docks at Southampton, an increase of 44 per cent. over the total for the corresponding month for 1934. This is due in part to the increased number of visitors to Great Britain this summer and partly to the extra traffic caused by the Naval Review. Cargo traffic for the same month showed an increase of 19 per cent. over July, 1934.

THE SCRAP HEAP

FANTASY?

[*The following is printed as it was received, addressed to the Editor*]

I wonder if your readers would be interested in what I, at any rate, regard as a rather strange experience which befell me at Paddington station. I will put it down here as it happened, and you can decide whether it merits inclusion in THE RAILWAY GAZETTE.

Being in London recently and desirous of making a call on the Publicity Department of the Great Western Railway, I arrived at Paddington at about 1.30 p.m. As I had not been to the station since the completion of the extensive alterations there, I was glad to find my objective over the entrance to the Metropolitan Railway without much trouble. The young lady at the enquiry office upstairs, to whom I stated my business, directed me to the fourth door on the left, and I went along, knocked, and opened the door, only to find the office empty. Reflecting that it was the luncheon hour, I decided to wait the return of the man I wanted, and sat down. Really I *was* rather tired, for it was one of those close and muggy days of which we have had so many of late.

Perhaps I ought to explain that the object of my call was to make some enquiries as to the early days of the Great Western Railway, so shortly to be celebrating its centenary. Well, as I have said, I sat down, and found myself gazing from the office window at the various departure and arrival platforms, thronged with passengers and others about their business.

Watching this animated scene for a minute or so, I am afraid—no doubt owing to the fact that I had recently lunched and that the air was close—I nearly dozed. But, even if I did, and I am not admitting anything of the kind—let's get this right, at the start—I was very soon awakened by a brisk step along the passage outside, and at the same time caught the aroma of a fine cigar. The footsteps stopped outside the door, and someone coughed once or twice, then knocked on the door, which, by the way, is marked "Private," and came quietly in.

Seeing me there, the newcomer apologised very graciously for his intrusion, and asked if I minded smoking. Then, without giving me an opportunity to reply, he placed a well-filled cigar case on the desk and invited me to help myself.

The cigar was, well, full-flavoured, and as I was lighting it, the donor coughed again, explaining that some years ago he had inadvertently swallowed half-a-sovereign, which there had been some difficulty in removing, and as a result his throat was affected. The thought occurred to me that his trouble was probably enhanced by his partiality for such strong cigars.

He moved closer to the office window the better to look out, and I had an opportunity of observing his appearance, and his peculiar attire. He was smallish, well set-up, with a high forehead and side whiskers, and was carrying, curiously enough, a high old-fashioned "stove-pipe" hat, which he had removed on entering. He wore a huge black necktie, swathed once or twice round his throat, and rather badly creased trousers of the "pepper and salt" variety, held underneath his boots by straps.

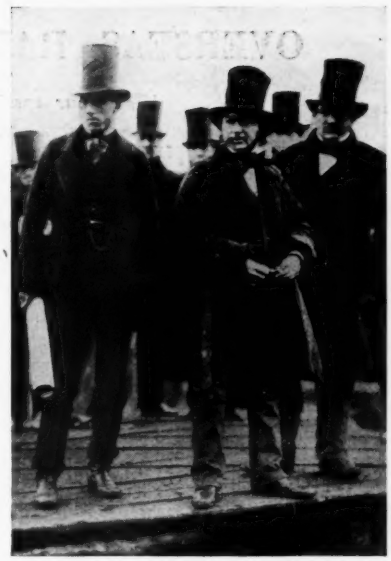
He was quite friendly and even inclined to gaiety, and the strange thing was that, in spite of the century-old style of dress, it did not seem to me in any way incongruous that he should be there and dressed as he was.

The visitor beckoned me to stand by him at the window, and after a short silence he suddenly began to speak, rather slowly. I thought at first he was addressing me, but it was fairly clear, after a minute or so, that he was talking to himself.

"A hundred years ago," he repeated once or twice. Then looking up into the roof of the station, ejaculated, "Excellent," adding, after a pause, "But those are not *my* columns, though they are holding up *my* roof." He counted up the number of platforms and appeared pleased. Because he was now apparently quite unconscious of my presence, as he continued talking to himself, I returned quietly to my chair, and whilst listening as well as I could to what he was saying, glanced at the leather cigar case and tried to decipher the well-worn initials on the corner. Beyond the fact that the middle of the three letters appeared to be a "K" I could make nothing of them.

It is not, of course, easy to recall precise words spoken, but I felt impelled to record them, and taking a pencil from my pocket I started to write down some of his remarks. "Dear old Paddington—eighty years old. Wharncliffe viaduct, they've widened that. Maidenhead bridge has *not* fallen down!" He smiled. "They've widened it too, and according to my design. Sonning cutting, much as it was, but with four roads. Reading, Swindon, Box tunnel." At the last word, he chuckled, adding "That opened their eyes!", then "Bath, Bristol, all as level as a — " —I missed the conclusion. Then, exultantly, "Glorious Saltash, they can't beat *that*."

Suddenly he caught sight of the far end of the station, and stared hard up into the roof. I looked, but could see nothing exceptional. Presently he ejaculated "Heavens! they've taken away my scrolls." Whatever he saw seemed to affect him deeply, for mururing to himself he turned on his heel and abruptly left the office. I called to tell him he had left his cigar case behind, but he didn't seem to hear me and the last I saw was his extraordinary figure as he ran, coat tails flying, across the "Lawn" and along the side of No. 8 platform. Opening the window I tried to call him, but my voice somehow refused to function. I tried again, and the effort to shout seemed to rouse me, for I found myself in the chair, gazing at a framed portrait in colour on the office wall. Curiously enough, the features were those of my recent visitor, and as Mr. ————, whom I had called to see, then returned, I asked whom the portrait represented. "Oh, that is the famous first engineer of the Great Western Railway—Isambard Kingdom Brunel. He built this station just 80 years ago."



Brunel, in characteristic pose, at the launch of the "Great Western" steamship

Well, if anyone had told me this story I should have put the whole experience down to some vivid kind of dream. But how was I to explain the large black cigar I was smoking? As to the cigar case, that seemed to have vanished with its owner, but I wish I had made *quite* sure about those initials.

I ought to explain, perhaps, that I have the habit of holding my pencil in my mouth, and when I removed the "cigar" I found it was a pencil—but if anyone doubts any part of this story I still have the pencil—to prove it.

W.G.C.

Editorial Note.—Within the past few months workmen have been engaged in removing the decorative iron scroll work from the end of the arches which have been a feature of Paddington station since it was built by Brunel in 1854.—ED. *R.G.*

XUM

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

MANCHUKUO

Gauge Conversion

One of the most remarkable gauge conversions ever attempted in the East is to be undertaken between 5 and 8 a.m. on August 31, as this entails a rapid change over from the 5 ft. (Russian) to the 4 ft. 8½ in. (Manchukuo) gauge throughout the 240 km. (150 miles) which separate Hsinking from Harbin. As the difference in gauge is only 3½ in., it is not possible to lay a third rail between the 5-ft. spaced rails, as the feet of the flat-footed rails used would overlap. Consequently the following carefully planned three-stage programme has had to be worked out.

Preparatory Arrangements

The preparatory stage entails the following works:—

(*a*) The renewal of about two-thirds of the sleepers, these being defective, prior to August 15.

(*b*) The removal of all bearing plates prior to August 29.

(*c*) Precautionary steps to be taken to counteract differences in lengths of rails on curves, due to alteration of curve radii as a result of gauge reduction, prior to August 15.

(*d*) Similar and other adjustments to be made at points and crossings for the same and other reasons.

(*e*) On the straight, two out of every three, and on curves alternate spikes are to be withdrawn from the inside of the rail to be moved inwards. Inside spikes are then to be two-thirds driven in the positions in which they will be required when the rails are moved inwards. On bridges—where both rails are to be moved inwards to preserve centring—both guard rails are to be removed to their new positions and alternate inside spikes of both running rails are to be removed, and two-thirds driven in their new positions. To facilitate rapid drawing, all spikes are to be hammered to remove rust.

(*f*) At points and crossings, the track is to be opened out and fish and other bolts are to be removed, oiled and replaced. Rodding and levers are to be prepared for the change over and other preparations made as required locally in each place.

The Actual Change Over

A labour force of 2,000 men is to be ready to start immediately at 5 a.m. on August 31, the distribution being 15 men for each 2-km. length, apart from stations. About ten men will be allotted to each set of points. Each supervisor will be provided with a portable telephone, and will report progress and completion of work to his section manager, who in turn will report to divisional headquarters, which will inform Harbin. The moment it is possible a trial train is to be run over the whole section, and, if all is well, through traffic running will then begin.

Results Achieved

The Asia express is to be scheduled to cover the 585 miles between Dairen and Harbin in 12 hr. 28 min. as soon as the conversion permits of its through running without break of gauge, a saving of six hours as compared with the existing schedule. The Hsinking-Harbin time will be reduced from 7 hr. 30 min. to 3 hr. 58 min. Probably the greatest financial gain accruing from this elimination of break of gauge at Hsinking will be in the through consignment of goods without break of bulk or handling.

(*See editorial on page* 337)

INDIA

Railway Facilities

Discussing railway facilities, the Agent of the Assam Bengal Railway explained to the members of the Local Advisory Committee that the results of the experimental reduction in fares on the Chittagong-Chandpur-Akhaura sections were financially disappointing. He could not, in the circumstances, hold out any prospect of the extension of such reduced fares to other sections. The Agent agreed that the more important passenger stations should have electric lighting. He hoped to be able to obtain funds to electrify Comilla station next year. The electrification of Gauhati would be taken up some time later.

The Jamnagar and Dwarka Railway authorities propose to introduce return tickets between Rajkot and Jamnagar at a fare and a half in order to encourage trade between these places.

Proposed Surcharge on Passenger Transport

A resolution passed by the Committee of the Karachi Buyers' and Shippers' Chamber requests the Government of India to levy surcharges on railway and steamer tickets, the proceeds of which would go to the Viceroy's Fund for the relief of those injured or rendered destitute in the Quetta earthquake. The surcharge should initially remain in force for two years. It is estimated that the levy will yield about Rs. 75 lakhs per annum. There is, however, little prospect of the Government of India accepting a proposal of this nature which amounts to discrimination in favour of road transport at a time when railway passenger traffic is steadily diminishing.

SOUTH AFRICA

Radio on Trains

Recent experiments conducted by the administration with a view to providing radio entertainment for passengers on long-distance main line trains have not proved successful. The equipment installed on the Imperial Press Conference train proved that when the train was in motion good reception could not be obtained, and it has therefore been decided not to proceed with further installations.

Reduced Suburban Fares

With effect from August 1, passenger fares on the Reef suburban lines have been reduced for distances of four miles and over, and also in short distance season tickets for journeys of from four to eleven miles. With the introduction of the reduced fares, the special week-day excursion fares will be withdrawn. It is estimated that the revised fares will result in an average reduction of 19 per cent. in the suburban passenger fares of the Witwatersrand.

Financial Position

The accounts for the months of April and May show a surplus of £379,763 revenue over expenditure after allowing for special appropriations of £133,333 to betterment fund, £81,166 to pension and superannuation funds, £166,667 special contribution to depreciation (rolling stock), and £66,667 towards writing dead assets out of capital account (Harbours). The revenue from transportation services for the month of May totalled £2,348,316, an increase of £254,541 on the previous year. Railway working expenditure totalled £1,586,762, an increase of £102,853.

POLAND

Railway Rehabilitation

The State Railways can now be said definitely to have emerged from the wholesale devastation of the war, in which 2,500 bridges, 60 per cent. of the stations and 75 per cent. of the watering installations are understood to have been destroyed. In 1919 also many of the lines were of strategic, but of little commercial value and many of them have had to be taken up and relaid in fresh areas. New lines are being constructed—chief among them that which links the industrial Polish Upper Silesian area with Gdynia the new Polish seaport—and five have been opened within a year.

Concurrently replacement of obsolete and out-of-date rolling stock has gradually taken place, until today Polish firms are turning out locomotives, coaches, and wagons that compare favourably with those of other countries. As a sample of modern Polish coaching stock, a special tourist train recently visited Berlin, Brussels, Paris, Marseilles, Cannes, Milan, and Venice before returning to Warsaw. It was equipped with sleeping, dancing, hair-dressing and parlour car accommodation.

Conveniences on Trains

On Polish expresses it is now customary to exhibit boards with the names of stopping stations as these are approached, giving passengers adequate warning and saving time at each stop. All second class compartments have seats such that they can be converted into four sleeping berths at night, and women attendants travel on the train.

RAILWAYS AND ROAD TRANSPORT SECTION

This section appears at four-weekly intervals

Road Transport in Ulster

THE Minister of Home Affairs for Northern Ireland has now announced the names of those who will constitute the first Northern Ireland Road Transport Board. The full number—seven—as provided in the Act has been chosen and they have for their chairman Mr. D. L. Clarke, O.B.E., Assistant Secretary, Ministry of Home Affairs, an appointment he now vacates in order to devote his whole time to the services of the board. The other members—the Earl of Enniskillen, Mr. James R. Haslett, Mr. Samuel G. Haughton, Mr. D. Wilson Smyth, D.L., Mr. Robert H. Smyth, D.L., and Mr. James E. Wilson—are part-time members and the official announcement states that " they will correspond to the part-time directors of a limited company and will be remunerated on the basis which is usual in the case of part-time directors." It is also made clear that they have undertaken a very responsible and onerous public service and the Government is under a debt of gratitude to them. At the time of writing no staff appointments have been announced, but it is pointed out that the main burden of administration of the board will fall upon the whole-time chairman and the technical staff to be appointed by the board. " The staff will, in accordance with the Act, be recruited from those already engaged in the industry, and the board will have the assistance of the experienced staffs who have hitherto carried on transport."

The board has a busy time in front of it for after September 1, no person shall use a motor vehicle on the road in the province for the carriage of passengers or merchandise for hire or reward except with the written consent of the board. One of the first duties will therefore be the issuing of permits to carriers to carry on for the time being. Tentative arrangements for the taking-over of the undertakings of the five principal operators, the Belfast Omnibus Co. Ltd., H.M.S. Catherwood Limited, the Great Northern Railway, the London, Midland & Scottish Railway (Northern Counties Committee), and the Belfast & County Down Railway, have been in hand for some time and it is anticipated that they will pass under the control of the board very soon and become the nucleus of the board's services. It is expected, too, that a good number of the leading provincial operators will also be taken over before the end of the year.

The British Motor Industry

THE annual volume " The Motor Industry of Great Britain " issued by the Society of Motor Manufacturers & Traders, grows more valuable each year. In the 1935 edition, just to hand, it is possible for example to see what proportion of oil engined vehicles are coming into use. It appears that last year the new registrations included 63,744 petrol-engined goods vehicles and but 1,494 with oil engines. Incidentally it is interesting to note that there was a considerable advance in electric vehicles at 336, compared with 116 the previous year, while steam also showed a revival although the total of new vehicles was only 168. When it comes to buses and coaches it may be noted that, while the new petrol-driven vehicles in these classes totalled 2,575, the number with oil engines was 818. Tables are now included showing the vehicles in use each year, from which it appears that last September the numbers in Great Britain were: Goods vehicles (petrol) 396,032, (oil) 4,303; buses and coaches (petrol) 42,289, (oil) 2,398.

During the season an extensive programme of road tours is carried out by the Great Southern Railways (Ireland) and our illustration shows one of the A.E.C. petrol-engined Regal coaches engaged on such service. It is fitted with a rear sliding door and the seats are of a type suitable for long-distance travel

XUM

Karriers in South Africa

Illustrations of the way in which the three-wheeled tractor and its development, the three-wheeled light truck, are rendering efficient service in overseas countries

THE two photographs reproduced on this page serve to bring out the fact that the mechanical horse scheme is being appreciated in distant parts of the British Empire as much as at home. The first also serves to bring out the difference between the old and new methods of transport in South Africa, the Karrier Cob with trailer, in which the mule team are obviously not interested, being one of a number of such outfits put into service during recent months by South African Railways and Harbours. Actually there are more trailers than tractors, for they are operated on the shuttle system, one tractor hauling several trailers in turn, leaving them at their destination to be unloaded when convenient, the tractor returning subsequently to collect the empty vehicles, but meanwhile being engaged on hauling other trailers. The outfits have already demonstrated their speed and handiness and economy, as compared with mule transport. It may be recalled that the Cob Major is designed to haul a four-ton load, while the Cob Six can deal with a six-ton load. The Cob Major has a four-cylinder engine of 11·8 rating which develops 30 b.h.p., while the Cob Six can be supplied either with a four-cylinder engine of 13·95 rating or a six-cylinder engine of 14·8 rating.

This illustration provides an effective contrast between the Karrier Cob with trailer and the mule team which has hitherto been so much used in South Africa. The Cob scores over the "hairies" in the matter of manœuvrability and in the fact that one Cob works several trailers

A view which brings out the handy mobility of the Karrier Colt for work on quays and in railway goods yards. It has a turning circle of only 18 ft. diameter and the platform is only 25 in. from the ground

The second picture is of one of the Karrier Colt trucks employed on the harbour side at Lourenco Marques, in Portuguese East Africa, where they deal with the transference of goods from ships to warehouse more rapidly than was previously the case. The Colt is very similar in its general arrangement to the Cob tractor, except that it has a wider track for the back wheels and in place of the coupling gear there is a tread steel plate platform. The wheels are fitted with solid tyres, 22 in. by 5 in., and this enables the platform to be only 25 in. from the ground, making loading and unloading an easy matter. The fact that it will turn within an 18 ft. circle is a feature of considerable advantage in many places. The vehicle is designed to carry a pay load of 2 tons and the chassis weight is 1 ton 5 cwt.

Like the Cob Major the Colt is fitted with a four-cylinder petrol engine which, while it produces 10 h.p. at 1,000 r.p.m., will develop up to 30 h.p. It is economical to run, so that an average day's work will only call for the consumption of two to three gallons of fuel. Power is transmitted from the offset engine, clutch and gearbox—alongside which the driver's seat is arranged—to a compensating gearbox, wherein, by the substitution of different ratio chain wheels, varying overall ratios can be obtained without dismantling the primary gearbox or the rear axle. From the compensating gearbox the drive is taken by a centrally placed propeller shaft through a sturdily-dimensioned rear axle to the road wheels. As the centre of gravity of the complete machine is extremely low, it is extraordinarily stable.

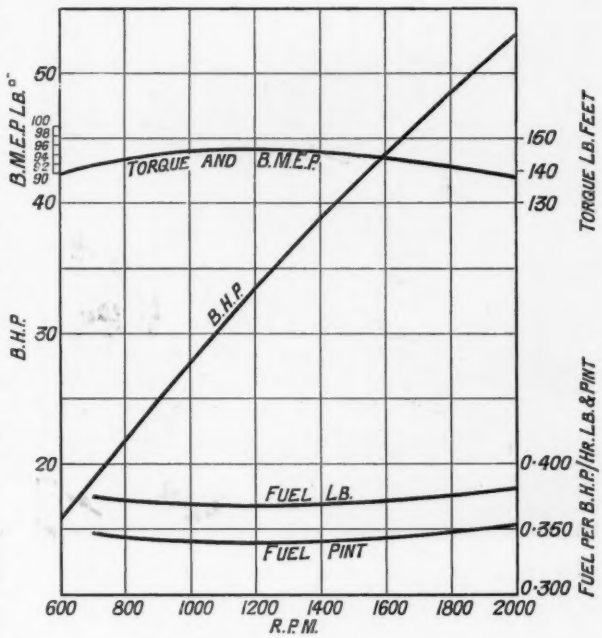
A deep section pressed steel frame, adequately braced, is employed, and whilst the usual type of underslung semi-elliptic springs are employed for the back wheels, the single front wheel is carried on springs of the helical coil type, fully enclosed. Pneumatic tyres may be fitted, of the 25 in. × 6 in. size, with twins on the rear wheels. The standard chassis also includes an all-metal two-seater cab and the chassis may be fitted with a tipping body.

New Road Vehicle Oil Engine

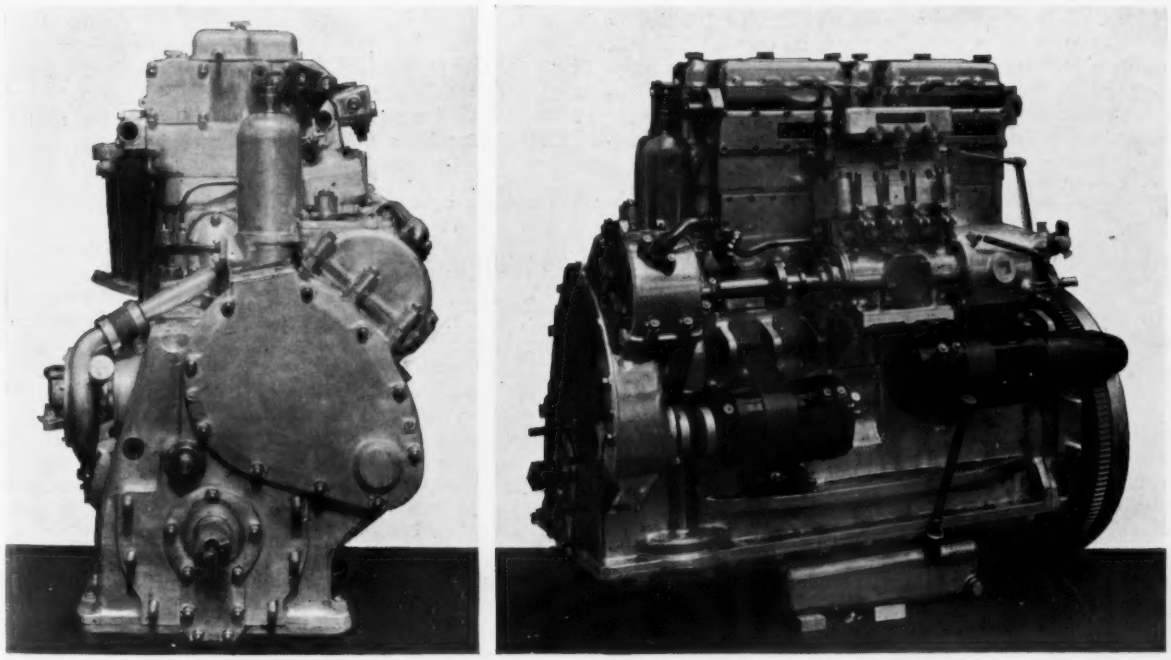
Introduction by the Gardner concern of a four-cylinder oil engine with a favourable power/weight ratio and of dimensions and weight that enable it to be fitted satisfactorily in light chassis

THE introduction of a new design of oil engine by Norris, Henty and Gardners, Limited, would be an event of importance in any case and the fact that the new 4LK model is considerably smaller than the very successful LW series ensures that it will receive full attention from all concerned with goods vehicles. It has a cylinder capacity of 3·8 litres and the power/weight ratio is high, the use of light metal alloys enabling the weight to be kept down to a remarkable degree. The bare weight of the engine is 575 lb. or with electric starting motor and light flywheel, 684 lb. Actually the swept volume is only 68 per cent. of the well-known Gardner LW engine, but the fuel consumption is of the same low order, the figures quoted being 0·370 lb. per brake horse-power hour (0·344 pint) at 1,000 r.p.m. rising to no more than 0·380 lb. per brake horse-power hour (0·354 pint) at 2,000 r.p.m. The makers affirm that with a given load a vehicle with the LK engine will travel 2·2 times as far as a petrol-engined vehicle on one gallon of fuel, and that under favourable circumstances the multiplier may be as high as 3. The characteristics of the engine are set forth in the graph from which it will be seen that 28 b.h.p. is developed at 1,000 r.p.m. and 53 b.h.p. at 2,000 r.p.m. A simple and efficient centrifugal governor controls the speed of the engine throughout its range, and a patented device enable the compression ratio to be as low as 14 to 1.

The four cylinders, the bore is $3\frac{3}{4}$-in. and the stroke $5\frac{1}{4}$-in., are cast in aluminium alloy in one block, with dry liners of hardened material, but the cylinder heads, also in aluminium alloy are cast in pairs, each carrying



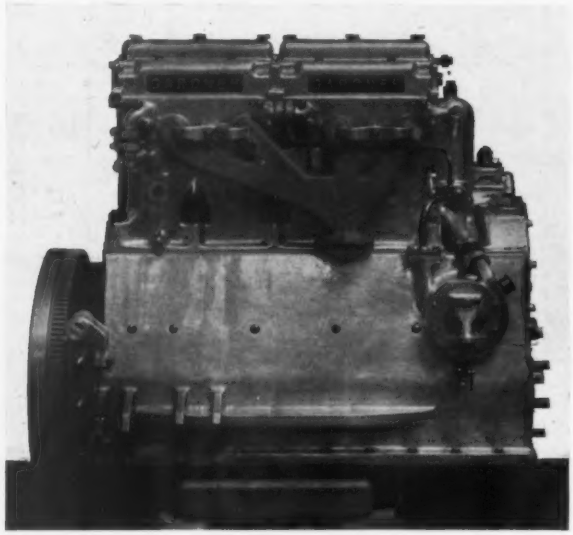
The technical characteristics of the new Gardner 4LK engine shown graphically



These views from the front and the near side show the neat arrangement of the details of the new Gardner 4LK engine which render it particularly suitable for use in forward-control vehicles

XUM

renewable valve and injector seats. A closed chamber is formed upon the upper part of the head in which are housed the pushrod-operated vertical overhead valves, of which there are two per cylinder, the valve levers sprayers and the patented devices for starting and for lubricating the valves and guides, the latter being detachable. Over the whole are neat aluminium covers which also form the air intake passages. The aluminium alloy



This view brings out how the offside of the new Gardner 4LK. engine is clear of fittings

pistons are the subject of a patent; they have the open combustion chamber formed in the crown and are fitted with five rings.

Weight saving is effected by the casting of the crankcase, as well as the readily detachable large sump, in Elektron. The nickel alloy steel crankshaft is carried in five white metal-lined bearings while the camshaft has six bearings, one being of the ball type. The rigid construction of crankcase is further supplemented by ten bolts extending from below the crank centre line to the cylinder feet. Large oil passages in the castings in conjunction with the holes drilled in the crankshaft and bearings enable pressure lubrication to be carried out from the oil pump. The mountings enable either three or four point suspension in the chassis to be arranged for and the gearbox may be fitted with the engine as a unit or separately.

The camshaft is driven by a triple roller chain, at the front of the engine, which also provides the positive drive for the dynamo. The camshaft chain wheel is slotted in the bolt holes to permit of accurate timing setting. The fuel pump and governor forms a separate unit on the near side of the engine where it is quite accessible. The drive is transmitted to the fuel pump camshaft by helical gears; the fuel pump camshaft gear sliding axially on its helically splined shaft, and coupled to the governor provides automatic advance and retard of the injection timing, a patented feature of the engine. The C.A.V.-Bosch injection pump is operated by the Gardner cam gear and fitted with Duplex ram return springs. The governor is of the centrifugal type, as used so successfully on the LW series engines, and controls the speed of the engine within pre-determined limits. The whole is totally enclosed and flood-lubricated from the main system. The fuel-sprayers are of the Gardner multiple-hole type with hydraulically-operated valve, simple in construction and requiring no adjustment of parts to be made by the user. The Gardner patent overflow return feed system incorporating an Amal diaphragm type fuel lift pump is standard equipment, the pump being neatly fitted accessibly on the injection pump cam box.

Reference has been made to the oil pump; it is driven by helical gears from the main camshaft and carried on the crankcase projecting into the base chamber. An especially generous and thoroughly accessible system of filtration is provided. The large capacity water pump is positively driven and incorporates a self-adjusting gland. There is a thermostat of positive type automatically controlling the temperature of the circulating water and provision is made for fitting a thermometer if desired.

When fitted, the dynamo, positively driven, and the starter are arranged on the nearside, as shewn in our illustrations. Another optional feature is the vacuum brake exhauster pump which may be built into the engine and automatically lubricated; it is of Gardner manufacture and of the reciprocating type. A fan may also be fitted, driven by a belt from the crankshaft.

Train and Bus in Los Angeles District

In a recent issue of the *Railway Age* some particulars were given of the way in which the Union Pacific Railroad deals with the traffic from and to the rapidly-growing but scattered districts of Los Angeles county. It was decided to build a new station at East Los Angeles from which to run buses as well as road services to the more outlying places and the layout of the station included bays in which the buses and coaches could wait for passengers arriving by train. A large parking place for other motor vehicles was also arranged and has in fact proved very popular, many passengers who have their own cars joining the train at the new station and so avoiding the crowded streets of Los Angeles. This interchange station is 6·5 miles east of the main Central station at Los Angeles. The first of the coach connection services was to Pasadena and now there are three routes covered, one through Pasadena to Glendale, a run of 19½ miles, another through Whittier, La Habra, and Fullerton to Anaheim, a distance of 24·5 miles, and a third is by way of Clearwater, Hynes and Long Beach to San Pedro, a run of 33 miles, which occupies about 80 min.

The interchange station at East Los Angeles, which was opened for business on May 15, 1929, is of typical California architecture, and is provided with a parking bay on the east side for the handling of heavy baggage and another bay on the same side to enable the passengers to board the buses without trouble. Connecting buses meet all trains and four buses may be loaded at one time. At first the train connection coaches were operated under the name of Union Pacific Stages under the control of a superintendent, reporting to the railway general manager at Los Angeles. Now, however, the general management is in the hands of Interstate Transit Lines, the bus-operating subsidiary of the Union Pacific railroad, with an assistant superintendent of Union Pacific Stages in direct charge.

A Transandine Link

Road services to connect the broken ends of the railway

FOLLOWING on the details given in THE RAILWAY GAZETTE of August 9 regarding the steps being taken by the Argentine and Chilean Governments to secure the restoration of railway facilities over that part of the Andes where the disastrous avalanche took place in January, 1934, we give some particulars of the road motor services which have been organised to bridge the gap between the railways. From Mendoza, in Argentina, a shuttle service is being operated by the Compania Internacional de Transportes Automoviles (C.I.T.A.) to Las Vacas, conveying passengers from one temporary terminus of the Transandine Railway to the other. The journey of 105 miles is an arduous one because the mountain track that has to be traversed is narrow and rough and in places exceedingly steep.

For the first 25 miles out of Mendoza a relatively high speed may be maintained but thereafter the road ascends and becomes twisty to reach La Quebrada del Toro (the Bull's Gorge). Under good weather conditions the crossing of this gorge occupies 90 minutes, for the track is narrow and dangerous and the atmosphere is not favourable to motor car engines. Through the Valley of Uspallata, the next stage takes the traveller to the place of that name where an ancient ranch has been taken over by the South American Hotel Company and transformed into an imposing hostelry. From there the road follows the left bank of the Mendoza River until a further climb into the mountain begins. Eventually La Jaula, nearly 8,000 ft. up, is reached through a succession of road tunnels,

One of the road tunnels in the Andes, on the road now being used by the motor services organised to serve as a link in place of the 150-mile stretch of the Transandine Railway which suffered so heavily in the avalanche of January, 1934

This view in the Andes gives an impression of one of the mountain roads being used by the road motor services that are now being operated over that part of the country on the borders of Argentina, where the railway lines were overwhelmed in an avalanche in the early days of 1934. The services run from Mendoza to Las Vacas, whence the Transandine Railway runs into Chile

XUM

followed by steep gradients complicated by hairpin bends on the way to a famous beauty spot, Paramillo de Las Vacas just before the destination at Las Vacas itself comes into sight.

From this point, which is also some 8,000 ft. above sea level, the Transandine Railway service operates into Chile but, in the summer, it is possible to travel all the way by car, and on the subsequent stretches the altitudes reached go up to 12,500 ft. The C.I.T.A. services are being maintained by a fleet comprising Hillman Twenty/70 saloon cars and Commer coaches and we are informed that they have given excellent service, maintaining communications under the most trying conditions. The photographs we reproduce give some idea of the arduous nature of the country which has to be traversed.

It is probable that the excellent work which this service is rendering will prove helpful to the committee that is to be appointed by the two Governments which, in addition to purely railway matters, is to consider the question of the co-ordination of transport and commercial interchange between the two countries by rail and road. The practical experience that is being gained under adverse circumstances is bound to be of value in the deliberations.

One of the Commer coaches engaged in the road motor services in connection with bridging the gap in the Transandine Railway lines

The Willeme-Coder Road-Rail Vehicle

The fact that a further twenty-five road-rail wagons, of the Willeme-Coder type, are about to be delivered to the French State Railways indicates the success attained by the system, which was described and illustrated in THE RAILWAY GAZETTE of September 22, 1933. The first vehicle was placed in service on the P.L.M. line and we learn that it has run over 100,000 km. (62,000 miles) and transported 4,000 tonnes of merchandise, from door to door.

The vehicle is mounted on four rail wheels, each of which may have a pneumatic-tyred disc bolted on its outer face to enable it to run on the road. In practice only one pair of road wheels is fitted as the other end of the vehicle is borne on the tractor, to make the outfit an articulated one. The fitting of the road wheels, or their removal, takes only a couple of minutes.

It was largely on account of the satisfactory working of the twenty-five Willeme-Coder road-rail vehicles in service on their lines that the French State Railways decided to place one in their exhibit at the Brussels Exhibition. It is to be seen among the railcars at the far end of the main Transport Hall, near the Modern station and has attracted a good deal of attention from railway engineers. The one shown is of the Decrets type, conforming strictly to the regulations of the new French Highway Code, and it incorporates running gear and Westinghouse brakes so that it may be included in any train in Europe running on 1·44 metre gauge track. This road-rail vehicle is the result of the collaboration of the Etablissements Willeme of Nanterre and the firm of Coder of Marseilles and Puteaux.

Road Motor Goods Services in Germany

Following on the delivery of new vehicles this year, two additional road motor services were opened on July 18 between Bad Schwalbach and Zarn, 51 km. (31·7 miles) and Bad Schwalbach and Hausen v.d.H., 31 km. (19·26 miles). They reach out into the Taunus district from Bad Schwalbach and connect 19 places, with some 10,000 inhabitants, with the State Railway system.

The growing tourist traffic in these parts makes the supply of fresh foodstuffs to the towns of considerable importance. The motor lorry also affords the holiday-maker a means of bringing his luggage from and to the railway. Complete lorry loads as well as small consignments are dealt with. The slate quarries and forestry industry are proposing to make use of the services for their transport needs. The regular service is performed by a 3-ton lorry, which traverses the route every second day. For special loads, and when complete lorry loads are offered, a 5-ton vehicle, with trailer, is also available.

Goods depots are provided in the towns and villages, but for loads of more than 300 kg. each, door to door delivery is made. The institution of these two lines completes the railway motor services in the west Taunus district. The route from Bad Schwalbach to Zorn connects with the one from St. Goarshausen and also with that from Eltville to Schlangenbad, creating a compact network permitting of through despatch of freight. The territory between the Rhine and the Lahn, which is poorly provided with railways, has thus been given a modern and efficient means of transport. The close connection between rail and road and the extensive ramifications of the railway's road motor services are especially noteworthy.

Education in Road Transport

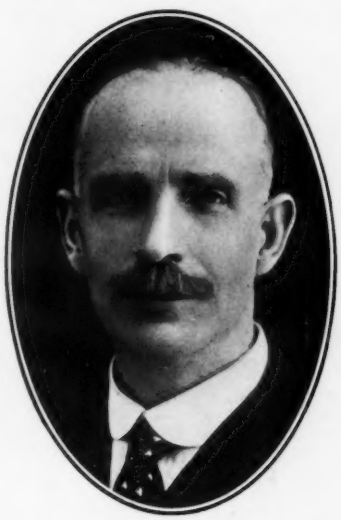
A syllabus has been issued by the Royal Society of Arts setting out details of a scheme of education and examination which has been prepared to encourage members of the administrative and operative staffs of transport undertakings to study subjects that will be useful to them in their work. It is the work of a committee representing road transport operators of the country in co-operation with representatives of universities and training colleges and covers a three years' course of study. In each yearly group there are three subjects and while it is hoped that students will take the whole course, they may be examined in any single subject; the first examinations are to be held next May. The syllabus shows that the course is a really comprehensive one and it is to be hoped that the managements of all transport undertakings, goods and passenger, will encourage their staffs in every possible way to prepare for the certificates and diplomas. The aid of education authorities up and down the country is being sought and if the students come forward in sufficient numbers there is no doubt that classes will be formed. In the meantime copies of the syllabus can be obtained from the Royal Society of Arts, John Street, Adelphi, London, W.C.2.

RAILWAY NEWS SECTION

PERSONAL

It is with regret that we note the death, on August 21, of Sir James Martin, Kt., who was one of the London Passenger Transport Board Arbitration Tribunal Commissioners.

Mr. A. Oldham, Divisional Signal and Telegraph Engineer, Eastern Division, L.M.S.R., retired from the railway on August 14, after 45½ years' service. He joined the London & North Western Railway at Crewe works in 1890, and was subsequently transferred to the Signal Engineer's Department. After some years in the drawing office, he became Chief Draughtsman and, later, Signal Assistant to Mr. J. T. Roberts. On the latter's retirement, Mr. Oldham was appointed Chief Signal Assistant and transferred to Derby in 1928. On Mr. Bound's appointment as Chief Signal and Telegraph Engineer, Mr. Oldham became Divisional Signal and Telegraph Engineer, Eastern Division, Derby, in August, 1929, the position from which he has just retired. During his service he was concerned with the following important signalling schemes: the widening through Preston; enlargement of Crewe station; introduction of Webb and Thompson system of power working points and signals, at Euston, Camden, London Road (Manchester) and other places; and was in immediate charge of the installations of automatic signalling between Camden and Watford, and Barking and Upminster in connection with those widenings.



Mr. A. Oldham,

Divisional Signal and Telegraph Engineer, Eastern Division, Derby, L.M.S.R., 1929-35

Mr. Oldham is a member, and member of council, of the Institution of Railway Signal Engineers.

Dr. Angel Sanchez, has been elected a Local Director and legal representative of the Entre Rios & N.E. Argentine Railways.

A decree has been issued by the Argentine Ministry of Public Works recognising the following as legal representatives of the Buenos Ayres Great Southern Railway: Dr. G. E. Leguizamon, Messrs. C. R. S. Harris, E. C. L. Meynell, William J. White, Dr. Angel Sanchez Elia, and Mr. Robin Stuart.

Mr. H. A. Couves has found it imperative to resign his chairmanship of Kelvin Bottomley & Baird Limited, Glasgow, owing to increasing calls of other business; he remains on the board as a Director, however. Mr. F. C. Stewart, who has been a Director since 1928, has been elected Chairman.

Mr. Charles Mitchell, one of the best known engine drivers on the G.W.R., is retiring on September 21. For over 31 years he has been a driver on the St. Ives branch. In the words of *The St. Ives Times*: "He will be missed by a wide circle of passengers, to whom his unfailing kindly greeting and smile have so long been welcome." Mr. Mitchell started work as a cleaner at Truro in 1892, from there he was sent to Penzance as a fireman in 1895; after three months he shifted to Reading, and from there to Winchester. In 1897, he was moved to Plymouth. Then he was promoted to goods fireman at Southall, and to the main line goods trains at Westbourne Park. Then followed promotion as passenger fireman and he served on the G.W.R. Aldgate-Mansion House "outer circle" service for two years. For the next 18 months he was fireman on London-Exeter expresses. Then came his final appointment as driver on the St. Ives branch in 1904.

Mr. E. W. Thomas, V.D., Locomotive and Carriage Superintendent, Assam Bengal Railway, retired on April 28, after 27 years' service with that company. Mr. Thomas was educated at Wycliffe College, Stone House, and received his training at Swindon works, G.W.R., first under Mr. W. Dean and later under Mr. Churchward. After a time in the drawing office at Swindon, he went to the United States to study American locomotive practice, and joined the Central Railroad of New Jersey, and also the Atlantic Coast Line at Wilmington, North Carolina. He worked there for a number of years on the footplate, in round houses, and also in drawing offices. In 1908 he was appointed an Assistant Locomotive Superintendent on the Assam Bengal Railway, where, after holding various posts of Works Manager, Pahartali, District Locomotive Superintendent and Superintendent of Stores, he was appointed Locomotive and Carriage Superintendent in 1931. Mr. Thomas was very popular with all his staff, and as a token of esteem the officers of the Locomotive and Carriage Department presented him, on his retirement, with a silver cigarette box suitably engraved, the presentation having been made by Mr. Coltman, who succeeds him as Locomotive and Carriage Superintendent.

Mr. E. W. Thomas,

Locomotive and Carriage Superintendent, Assam Bengal Railway, 1931-35

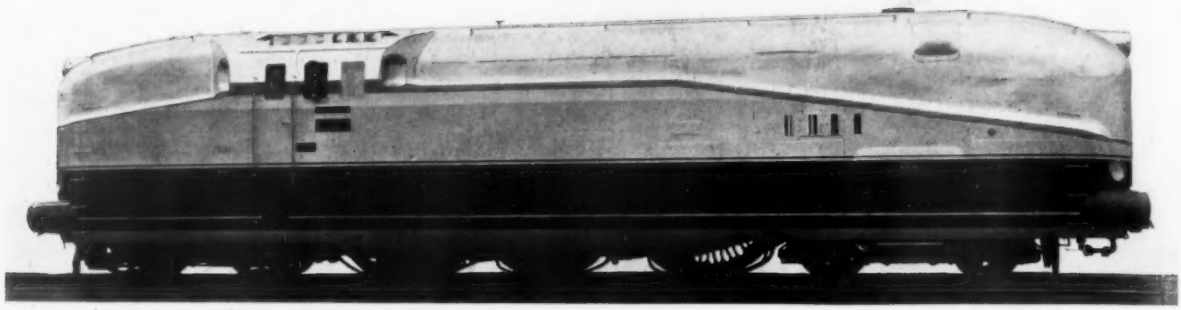
Indian Railway Staff Changes

Mr. H. N. Parker has been appointed to officiate as Deputy Traffic Manager, Transportation, E.B.R., as from July 17.

Lt.-Col. C. F. Carson, M.C., R.E., has been appointed to officiate as a Divisional Superintendent on the N.W.R., as from June 19.

Mr. R. C. Ivey has been confirmed as Deputy Transportation Superintendent, G.I.P.R., as from July 19.

We regret to record the death, on August 21, of Sir Archibald Gold, Kt., D.L., J.P., Chairman of Prichett & Gold and E.P.S. Co. Ltd. Born in 1870, Sir Archibald was a Captain and Temporary Major in the Essex Yeomanry, 1914-17, and commanded the Colchester depot in 1914. He also



New 4-6-4 high-speed streamlined tank locomotive, Series 61, German State Railway

Interior of cab of new 4-6-4 streamlined tank locomotive, German State Railway

(*See article opposite*)

served in the Remounts Department at the War Office. He was knighted in 1918 and was a J.P. and D.L. for Essex and a J.P. for Suffolk also.

Mr. T. H. Bygate, whose retirement from the position of District Engineer, Darlington, N.E. Area, L.N.E.R., was noted in our issue of August 23, was the recipient the other day of a presentation—in the form of an oak dining table—made to him by Mr. E. S. Bradley, Assistant District Engineer, on behalf of Mr. Bygate's staff.

Mr. R. T. G. Tangye, O.B.E., B.A., LL.B., at present Deputy to the Metropolitan Traffic Commissioner, has been appointed also to act as Deputy to the Chairman of Traffic Commissioners for the South-Eastern Area (Sir Henry Piggott) to assist in dealing with applications from goods carriers for licences under the Road and Rail Traffic Act, 1933.

Many of those British railway officers who visited the United States during the period from 30 to 35 years ago, when considerable interest was being taken in American railway methods, met Mr. A. H. Yocum, at that time the Signal Engineer of the Philadelphia & Reading Railroad. Mr. Yocum held that office until 1931, when he retired. We regret now to hear of his death on June 23 last in his 71st year.

Dr. Wulff, sometime President of the Berlin Division of the former Prussian State Railways, who has for several years past been editor of the official weekly journal of the Central European Railway Association, the *Zeitung des Vereins Mitteleuropäischer Eisenbahnverwaltungen*, has asked to be relieved of that office on account of advancing years. Herr R. Lüdicke, head of a section in the Berlin Divisional Management has been appointed to succeed Dr. Wulff and will probably assume office at the beginning of October.

Ulster Transport Board

The Northern Ireland Minister of Home Affairs announces the appointment, under the new Road and Railway Transport Act, of the following as members of the Transport Board:—

Messrs. D. L. Clarke (Chairman), Lord Enniskillen, Messrs. J. R. Haslett, S. G. Haughton, D. W. Smyth, R. H. Smyth, and J. E. Wilson.

With the exception of the Chairman, who relinquishes the position of Assistant Secretary, Ministry of Home Affairs, to fill this new whole-time post; of Lord Enniskillen; and of Mr. R. H. Smyth, who in addition to his commercial connection is Chairman of the Londonderry Port and Harbour Commissioners; all the members represent local commerce. Apart from the Chairman, members will all be part-time members, and railway interests will not be directly represented on the board.

New German Streamlined Tank Locomotive

(See illustrations opposite)

One of the locomotives forming the basis of the comprehensive experiments now being undertaken by the German State Railway, and described in The Railway Gazette of March 1, 1935, is the 4-6-4 tank locomotive illustrated on the opposite page and recently completed by the firm of Henschel & Sohn A.G., Kassel. We have already given a general arrangement drawing of this locomotive in our aforementioned issue, but we may repeat that this engine is one of two of a type (Series 61) designed for hauling trains of four eight-wheeled coaches of light construction at speeds up to 175 km.p.h. (108¾ m.p.h.). The form of the streamlined casing is such as to secure minimum air resistance, while providing for the use of the locomotive in both directions of running. The motion work and valve gear are similar to those of the 4-6-4 streamlined tender locomotive (Series 05), of which we gave a fully illustrated description in The Railway Gazette of June 21 last, but that, for reasons of space and weight, only two cylinders instead of three are used in this locomotive. The boiler has a narrow firebox of copper, as compared with the wide firebox of the 05 Series engines.

The length of the tubes is 5 m. (16 ft. 4¾ in.), and the water is stored in side tanks and a tank between the 80 mm. (3⅛ in.) bar frames. The coal is carried behind the driver's cab. As the locomotive is required to run backwards as well as forwards at high speeds, there are two reversing screw brackets. All wheels of the locomotive are braked on both sides.

Two turbo-generators, each of 10 kW., supply electricity for train lighting, for the fan motors of the air heating, equipment for charging the train batteries, and for the electric train control equipment. The steps at the coach doors are drawn in during running, and can be unfolded from the driver's cab by electric remote control.

The principal dimensions of the locomotive are as follow:—

Cylinders	diam. 460 mm. (18⅛ in.); stroke, 750 mm. (29½ in.)
Boiler working pressure	20 kg. per sq. cm. (284 lb. per sq. in.)
Boiler heating surface, tubes and flues	137 sq. m. (1,474·1 sq. ft.)
,, ,, firebox	16 ,, (172·2 sq. ft.)
	153 ,, (1,646·3 sq. ft.)
,, ,, superheater	69 ,, (742·4 sq. ft.)
Total	222 ,, (2,388·7 sq. ft.)
Grate area	2·76 sq. m. (29·7 sq. ft.)
Coupled wheels, diam.	2,300 mm. (7 ft. 6⅝ in.)
Weight of engine in working order	126 metric tons (124 tons)
Adhesion weight	54 metric tons (53 tons 3 cwt.)
Water capacity	16·5 cu. m. (3,630 gallons)
Fuel capacity	5 metric tons (4 tons 18 cwt.)

Soviet Orders in Great Britain

The orders placed in Great Britain by Soviet trading organisations in July amounted to £1,799,781, as compared with £860,132 in the corresponding month of 1934. In the first seven months of this year the orders placed and purchases made amounted to £6,324,412 as compared with £5,840,345 in the first seven months of 1934, representing an increase by 8·3 per cent. The following table shows the principal orders placed for engineering and allied materials:—

	July, 1934	July, 1935	Jan.-July, 1934	Jan.-July, 1934
	£	£	£	£
Machinery and equipment ..	98,457	610,410	871,953	1,560,819
Steel and ferrous alloys ..	210,186	2,873	1,034,284	449,169
Non-ferrous metals ..	117,894	399,020	1,258,395	1,522,626
Rubber ..	271,400	201,268	1,416,881	476,498

The orders for machinery and equipment have nearly doubled this year, while those for steel and ferrous alloys have fallen to somewhat less than half of 1934. The purchase of non-ferrous metals, on the other hand, has shown an increase by 21 per cent., but that of rubber has declined to about a third of last year. The purchases of miscellaneous goods have also increased and were this year more than double the amount of 1934.

Forthcoming Events

Sept. 3 (*Tues.*)—Retired Railway Officers' Society, at Abercorn Rooms, Liverpool Street, London, E.C. 2, 2.30 p.m. Ordinary Meeting.

Sept. 10 (*Tues.*)—Permanent Way Institution (Sheffield), at Royal Victoria Hotel, 7 p.m. "Curves," by Mr. W. C. Thompson.

Sept. 13 (*Fri.*).—Railway Club, at Royal Scottish Corporation Hall, Fetter Lane, London, E.C.4, 7.30 p.m. "Power-Operated Signals," by Mr. E. Wallis.

Sept. 19–28.—"The Model Engineer" Exhibition, at Royal Horticultural Hall, Vincent Square, London, S.W.1.

Sept. 21 (*Sat.*).—Permanent Way Institution (Manchester-Liverpool), at Blackpool, 3 p.m. "The Permanent Way," by Mr. H. L. Douglas; "Removing a Building," by Mr. F. McCandlish.

Oct. 1 (*Tues.*).—Retired Railway Officers' Society, at Abercorn Rooms, Liverpool Street, London, E.C.2, 2.30 p.m. Ordinary Meeting.

Oct. 2 (*Wed.*)—Permanent Way Institution (Leeds), at Quebec House, Quebec Street, 7.30 p.m. "Some Permanent Way Problems," by Mr. R. Gurd.

Oct. 2–12.—International Exhibition of Inventions, at Central Hall, London, S.W.1.

XUM

NOTES AND NEWS

Relief Train for Burlington Zephyr.—Heavy bookings on August 3 for the morning journey of the C.B. & Q. Zephyr from Chicago to St. Paul necessitated the provision of a steam-hauled train as a relief portion running 30 min. behind the usual service. Eighty passengers who could not otherwise have been accommodated travelled by the steam train. Since June 2 daily bookings have averaged 26 in excess of the capacity of the Zephyrs on each journey in both directions.

Private Saloon for Turkish President.—A German-built saloon has been delivered at Istanbul for the use of Kemal Attaturk, the President of Turkey, who makes frequent and lengthy tours of the country. The vehicle is luxuriously equipped and is carried on two four-wheel bogies. It is provided with corridor connections, and in this it differs from a saloon used for even more extensive official tours by M. Titulesco, the Roumanian Foreign Minister who prefers to be isolated from the rest of the train by which he is travelling and therefore has no corridor connection on his carriage.

The Institute of Transport Examinations, 1936.—The next Institute of Transport examinations for Graduateship and Associate Membership will be held on April 30, May 1 and 2, 1936, in London and at a number of provincial and overseas centres. As in previous years, principal transport undertakings, subject to the exigencies of business, will grant leave without loss of pay, to employees who wish to sit for the examinations. Full particulars of the examinations, previous question papers (price 1s. a set, post free) and copies of a booklet entitled "The Institute of Transport Examinations: Notes for the guidance of candidates unable to attend preparatory courses" (price 2s. 6d., post free) may be had on application to the Secretary, the Institue of Transport, 15, Savoy Street, W.C.2. The closing date for the receipt of applications to sit for the examinations is March 1, 1936. Prospective candidates are advised to confirm their eligibility to sit for the examinations they have in view, and this they may do by communicating with the Secretary of the institute.

Ticket printed on a ticket issuing machine while the visitor waits, at the Netherlands Railway Museum (See note on page 334). The inscription says: "Tell your acquaintances what you have seen"

Railway Exhibition for Tyneside.—An exhibition such as the North has not seen since the L.N.E.R. centenary celebrations in 1925 is being planned for Sunday, September 8, in connection with Gateshead Civic Week. The L.N.E.R. locomotive works at Gateshead are to be transformed into a great show ground in which will be gathered examples of the latest rolling stock and equipment, including the streamlined locomotive *Cock o' the North* the speed record breaking engine *Papyrus*, diesel coaches, sleeping cars, kitchen cars, a 45-ton breakdown crane, and snow ploughs. The exhibition will be opened at 10.0 a.m. by Sir Murrough J. Wilson, Deputy Chairman of the L.N.E.R., with Mr. Thomas Hornsby, Divisional General Manager, presiding. Tickets will be obtainable at all local railway booking offices and proceeds will be given to local and railway charities.

Future of the Locomotive Industry.—Discussing the future of the locomotive industry at the meeting of Robert Stephenson & Co. Ltd. on August 21, Mr. W. Benton Jones said that even if international trade remained restricted for some time, the demand for locomotives appeared likely to increase in the near future; the recent increase in buying suggested that we were nearing the end of the period of non-renewal resulting from the reduction in transport of recent years. As to the home market, that had been affected by the non-renewal policy and by the amalgamation of railways, but the railway companies had purchased locomotives from manufacturers in the past and had recently recommenced to purchase. There was also the question of what were known as industrial locomotives, an industry open only to private manufacturers. Generally, it was reasonable to anticipate that there would be in the future a very considerable demand, both at home and abroad, for locomotives made in British works.

Leeds Stations Scheme.—The L.M.S.R. and L.N.E.R. announce that, in connection with the extensive alterations now being carried out of the signalling arrangements at Leeds (New) station, it has been decided to re-number the platforms at both the Wellington and New stations, so as to bring them into line with what will be the ultimate platform numbering when the full scheme of amalgamating the two stations is carried out. This re-numbering will be brought into operation on Monday, September 30, when the numbers will read consecutively from the Wellington station platform No. 1, nearest to City Square, to No. 16 in the New station, which is at present No. 10, as follows:—

Wellington Station

Platform	No. 6	will become	No. 1.
,,	No. 5	,,	No. 2.
,,	No. 4	,,	No. 3.
,,	No. 3	,,	No. 4.
,,	No. 2	,,	No. 5.
,,	No. 1	,,	No. 6.

New Station

Platform	No. 1	,,	No. 7.
,,	No. 2	,,	No. 8.
,,	No. 3	,,	No. 9.
,,	No. 4	,,	No. 10.
,,	No. 5	,,	No. 11.
,,	No. 6	,,	No. 12.
,,	No. 7	,,	No. 13.
,,	No. 8	,,	No. 14.
,,	No. 9	,,	No. 15.
,,	No. 10	,,	No. 16.

"Frank Thomson" Pennsylvania Railroad Scholarships.—Awards of the two "Frank Thomson" scholarships available to sons of Pennsylvania Railroad employees, for four-year terms beginning with the academic year 1935-36, have now been made. The "Frank Thomson" scholarships are worth $800 each annually and are awarded for a full four-year course in an engineering or allied subject at any college or university in the U.S.A. They are supported from the income of a memorial trust fund established in 1907 by the children of Frank Thomson, sixth President of the Pennsylvania Railroad, who held office from 1897 to 1899. Their purpose is to enable sons of Pennsylvania Railroad employees to obtain technical educations and thus qualify themselves for transportation careers. Since the founding of the "Frank Thomson" scholarships, 51 men have been educated under the provisions of the endowment and six others are still in college, in addition to the two appointments now announced.

L.M.S. Railway Telegraphs: Annual Military Training.—The 15 days annual training of No. 2 Company L. of C. Royal Signals (Supplementary Reserve), which is composed entirely of L.M.S.R. personnel, took place at the Railway Training Centre, Longmoor Camp, Hants, from August 7 to August 21 under the Command of Major R. Tandy. On arrival at Borden station, members of the company changed on to the military railway and were conveyed to Longmoor Camp, where they were received by the Commandant (Col. J. E. S. Greig) of the Railway Training Centre. Preparations already worked out on paper were immediately put in hand for military instructions and drill, and also practical instruction in Morse code and the construction of telephone lines on the 9 miles of the Woolmer Instructional Military Railway. During camp, inspections were made by important military officials from the War Office, including the Quarter-Master General and the Chief Signal Officers of the Eastern and Western Commands. The weather was exceptionally good during the whole 15 days under canvas. Sir Harold Hartley, Vice-President, L.M.S.R., presented a silver cup for a shooting competition between No. 2

Company, and the L.M.S.R. Workshop Company, also in camp at the same time. Organised sports and competitions, including cricket, water polo, football, took place nearly every afternoon and concerts most evenings. Week-end trips to Southsea, Portsmouth, etc., were enjoyed by the men. Church parades took place on both Sundays and the company was congratulated on its very fine turn out. With the exception of 1932, the company has been to camp at Longmoor since it was first formed in 1925, and is looking forward to next year's training.

Electric Power for L.N.E.R. Restaurant Cars.—In connection with its fleet of restaurant cars equipped with electric cooking appliances, the L.N.E.R. is installing pre-heating plugs at various points in order to supplement the supply of electric power obtained from storage batteries. The provision of plugs will enable the restaurant cars to be re-charged with electric power and the cooking to be proceeded with during the time they are standing at stations or in sidings prior to being attached to outgoing trains. New or additional pre-heating plugs are being installed at Liverpool Street, Clacton, Ely, Hunstanton, Norwich, Hull, Glasgow, Fort William, Mallaig, and Heaton. At Heaton the plugs will be used in connection with the working of excursion trains between Glasgow and Whitley Bay, and the running of the new Silver Jubilee train between King's Cross and Newcastle beginning in October next.

Road Accidents.—The Ministry of Transport return for the week ended August 24, 1935, of persons killed or injured in road accidents is as follows. The figures in brackets are those for the corresponding period of last year :—

	Killed, including deaths resulting from previous accidents	Injured
England ...	... 110 (134)	4,354 (4,756)
Wales ...	... 9 (3)	234 (222)
Scotland ...	... 11 (22)	479 (481)
	130 (159)	5,067 (5,459)

The total fatalities for the previous week were 138, as compared with 155 for the corresponding period of last year.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 34th Week			Totals to Date		
	1935	1934	Inc. or Dec.	1935	1934	Inc. or Dec.
L.M.S.R. (6,925¼ mls.)	£	£	£	£	£	£
Passenger-train traffic...	564,000	576,000	– 12,000	16,871,000	16,479,000	+ 392,000
Merchandise, &c. ...	443,000	445,000	– 2,000	14,983,000	14,921,000	+ 62,000
Coal and coke ...	218,000	223,000	– 5,000	7,633,000	7,635,000	– 2,000
Goods-train traffic ...	661,000	668,000	– 7,000	22,616,000	22,556,000	+ 60,000
Total receipts	1,225,000	1,244,000	– 19,000	39,487,000	39,035,000	+ 452,000
L.N.E.R. (6,336 mls.)						
Passenger-train traffic...	407,000	402,000	+ 5,000	10,944,000	10,646,000	+ 298,000
Merchandise, &c. ...	284,000	281,000	+ 3,000	10,356,000	10,364,000	– 8,000
Coal and coke ...	224,000	223,000	+ 1,000	7,426,000	7,618,000	– 192,000
Goods-train traffic ...	508,000	504,000	+ 4,000	17,782,000	17,982,000	– 200,000
Total receipts	915,000	906,000	+ 9,000	28,726,000	28,628,000	+ 98,000
G.W.R. (3,749¼ mls.)						
Passenger-train traffic...	285,000	271,000	+ 14,000	7,105,000	6,977,000	+ 128,000
Merchandise, &c. ...	171,000	177,000	– 6,000	6,063,000	6,011,000	+ 52,000
Coal and coke ...	102,000	105,000	– 3,000	3,290,000	3,324,000	– 34,000
Goods-train traffic ...	273,000	282,000	– 9,000	9,353,000	9,335,000	+ 18,000
Total receipts	558,000	553,000	+ 5,000	16,458,000	16,312,000	+ 146,000
S.R. (2,171 mls.)						
Passenger-train traffic...	386,000	387,000	– 1,000	10,360,000	10,061,000	+ 299,000
Merchandise, &c. ...	63,000	68,000	– 5,000	2,049,500	2,173,000	– 123,500
Coal and coke ...	30,000	33,000	– 3,000	992,500	1,041,000	– 48,500
Goods-train traffic ...	93,000	101,000	– 8,000	3,042,000	3,214,000	– 172,000
Total receipts	479,000	488,000	– 9,000	13,402,000	13,275,000	+ 127,000
Liverpool Overhead ... (6½ mls.)	1,414	1,284	+ 130	40,580	39,248	+ 1,332
Mersey (4½ mls.) ...	3,599	3,707	– 108	136,454	139,249	– 2,795
*London Passenger Transport Board ...	519,400	523,900	– 4,500	4,308,200	4,228,700	+ 79,500
IRELAND						
Belfast & C.D. (80 mls.) pass.	3,587	3,482	+ 105	89,524	88,405	+ 1,119
,, ,, goods	494	415	+ 79	16,984	17,460	– 476
,, ,, total	4,081	3,897	+ 184	106,508	105,865	+ 643
Great Northern (543 mls.) pass.	13,100	13,800	– 700	362,850	342,600	+ 20,250
,, ,, goods	8,200	8,500	– 300	305,950	291,100	+ 14,850
,, ,, total	21,300	22,300	– 1,000	668,800	633,700	+ 35,100
Great Southern (2,124 mls.) pass.	33,866	32,170	+ 1,696	843,665	824,968	+ 18,697
,, ,, goods	31,641	31,311	+ 330	1,147,314	1,073,864	+ 73,450
,, ,, total	65,507	63,481	+ 2,026	1,990,979	1,898,832	+ 92,147

* 8th week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year ; last year's figures are, however, adjusted for comparative purposes

British and Irish Railways Stocks and Shares

Stocks	Highest 1934	Lowest 1934	Prices Aug. 28, 1935	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	66½	48½	47	–1½
5% Con. Prefce. ...	118	109	115½	–4
5% Red.Pref.(1950)	115	107	110½	–1
4% Deb.	117	105	113	–2
4½% Deb. ...	119	109	117½	—
4½% Deb. ...	129½	115¼	126½	–1
5% Deb.	135	126¼	137½	–1
2½% Deb.... ...	75	64	73	–5
5% Rt. Charge ...	134 7/16	123¼	133½	–2
5% Cons. Guar. ...	132 5/4	121 5/4	128½	–4½
L.M.S.R.				
Ord.	30½	19½	18	–1
4% Prefce. (1923)	64¼	41	50	–3
4% Prefce. ...	87	69½	80	–2
5% Red.Pref.(1955)	107	92½	101½	–1
4% Deb.	114 1/8	100½	104½	–2
5% Red.Deb.(1952)	118 11/16	111¼	115½	—
4% Guar.... ...	106½	96 5/4	101½	–½
L.N.E.R.				
5% Pref. Ord. ...	24 5/4	13½	10	–½
Def. Ord.	11½	6 7/8	5¼	–¼
4% First Prefce....	76	59½	56	–3
4% Second Prefce.	47	25½	21	–1
5% Red.Pref.(1955)	94½	80	78½	–3
4% First Guar. ...	104	92	97½	–1½
4% Second Guar.	97 7/8	86½	89½	–2½
3% Deb.	90	74½	80	–1½
4% Deb.	114	99¼	103	–2½
5% Red.Deb.(1947)	117	108	113½	—
4½% Sinking Fund Red. Deb.	111¼	105¼	110	—
SOUTHERN				
Pref. Ord.... ...	90	63 1/8	78	–3
Def. Ord. ...	32 5/8	19	19	–1½
5% Prefce. ...	118 3/16	107½	115½	–4
5% Red.Pref.(1964)	115 5/4	107½	114½	—
5% Guar. Prefce.	132	120 5/4	129½	–4
5% Red.Guar.Pref. (1957)	119½	113	117½	—
4% Deb.... ...	116½	103¼	112½	–2
5% Deb.	134	124 15/16	136½	—
4% Red. Deb. 1962–67	113 11/16	105 9/16	113½	—
BELFAST & C.D.				
Ord.	6	5	8½	+4½
FORTH BRIDGE				
4% Deb.	110	100	108½	—
4% Guar. ...	110	100	107½	—
G. NORTHERN (IRELAND)				
Ord.	9 5/4	4 15/16	14	—
G. SOUTHERN (IRELAND)				
Ord.	25	12½	41	+9
Prefce.	21½	13 15/16	46	—
Guar.	48	39	77	–1
Deb.	67	59	78	–2
L.P.T.B.				
4½% "A" ...	126	115	123½	–1
5% "A" ...	135½	124½	133½	–1
4½% "T.F.A." ...	113½	107½	111	—
5% "B" ...	131 5/4	118	127½	—
"C"	97	73	100	—
MERSEY				
Ord.	15¼	7	12	—
4% Perp. Deb. ...	93½	82½	94½	—
3% Perp. Deb. ...	66½	61½	70½	—
3% Perp. Prefce.	54	44½	52½	—

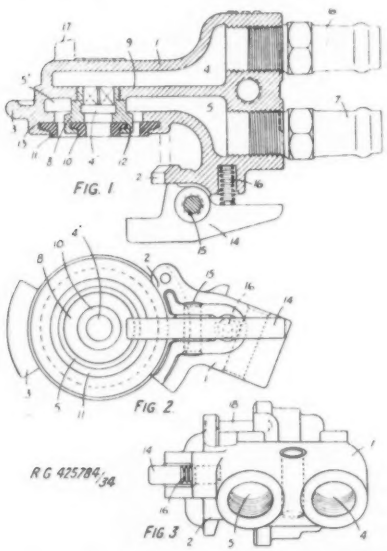
* ex dividend

ABSTRACTS OF RECENT PATENTS*

No. 425,784. Pipe Couplings

N. G. Cadman and The Westinghouse Brake & Saxby Signal Co. Ltd., both of 82, York Road, London, N.1. January 2, 1934.

The body 1 of a coupling head is provided with two passages 4 and 5, arranged side by side, which are adapted to be connected to two conduits on the vehicle through hose nipples 6 and 7. These passages 4 and 5 communicate respectively with concentric passages 4^1 and 5^1, which are at right angles thereto and lead to the face of the coupling head. The wall of the inner concentric passage 4^1 is constituted by a hollow bushing member 8 screwed into an aperture in the wall 9 between the passages 4 and 5. The outer end of the bush member 8, at the face of the coupling head adapted to engage with the corresponding face of a co-operating coupling head, is provided with a gasket 10 which surrounds the inner concentric passage 4^1 and is arranged to project slightly beyond that face; similarly, a gasket 11 is provided around the outer concentric passage 5^1. When a pair of coupling heads are secured in engagement with one another, the inner gasket 10 serves to isolate the inner passage 4^1 from the outer passage 5^1 and the outer gasket 11 isolates the latter from the

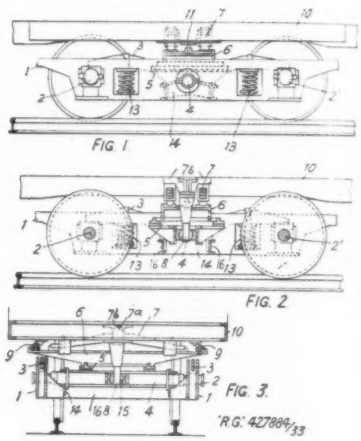


atmosphere. The gaskets are L-shaped in cross-section, having the horizontal arm of the L arranged to engage in an annular recess 12 or 13. Associated with the coupling head is a locking device which consists of a bar 14 pivotally mounted at 15 on the horn 2 of the head adapted to be normally maintained in the locking position by a spring 16 located in a recess in the horn 2 and abutting against the bar 14. When it is desired to couple two coupling heads, they are rotated with respect to one another with the locking devices held by hand in the release positions against the action of the springs 16, until the two heads are brought firmly into engagement with one another by the horns 2 engaging with the tongues 3 of co-operating coupling heads, whereupon the locking devices are released and brought into their locking positions by means of the springs 16. With the locking devices in their locking positions, reverse rotation of the co-operating coupling heads is prevented by the engagement of the bar 14 on each coupling head with a projection 17 on the co-operating head. Relative rotation of the coupling heads is limited by a stop 18 on each head (Fig. 3).—(*Accepted March* 21, 1935.)

No. 427,884. Double Axle Bogies

H. Liechty and R. Liechty, both of 24, Weststrasse, Berne, Switzerland. July 31, 1933.

The bogie frame 1 hangs from springs 13 which in turn are hung from the girder members 3 arranged in the longitudinal direction of the bogie and resting on the bearing boxes of the two axles 2 and 2^1. In order to ensure that the pressure on the axles may be equally distributed in the longitudinal direction, the main frame 10 of the vehicle rests on a transverse member 4 (Fig. 3), which is journalled in the bogie frame 1 in bearings (Fig. 3), disposed approximately at the height of the wheel axles 2 and mounted on the cross members 16 of the bogie frame. The latter is arranged for oscillation about the cross member 4 so that it can swing about the cross member in travelling over uneven track and can eliminate changes of load in the longitudinal direction. The cross member 4 carries an annular turntable 5 on which is mounted a platform 6. On this platform rest the two cradle springs 7 which are arranged transversely to the longitudinal axis of the vehicle and have the upper ends of their clamping boxes 7*a* formed as knife edges (Fig. 3). Each knife edge engages in a longitudinal groove of a supporting plate 7*b* fastened on the main frame 10. A lateral supporting spring 9 which supports the car body is mounted at each side of the platform 6. By means of the arrangement described the springs 7 and 9, of which the former take some 70 per cent. and the latter some 30 per cent. of the load, support the vehicle body along its longitudinal axis on the knife edges of the spring clamping boxes 7*a* and at the side on the springs 9. The platform 6 is held in its position relatively to the car body by means of the lateral plates 11 which are secured to the main frame 10 and engage with slots in the platform 6 so that the latter cannot participate in the turning of the bogie. All the movements of the body in the longitudinal and transverse directions are derived from the pivot pin 8 which is secured to the main frame 10 and



mounted on the cross member 4 by a ball joint 15 at the height of the axle 2 so as to oscillate and rotate. The fact that the ball joint 15 is at the height of the plane passing through the wheel axles, ensures that only a minimum of the movement of the bogie will be transmitted to the body since at the point 15 the movement of the bogie is a minimum, because the ball joint 15 forms the centre of oscillation of the bogie in travelling round a curve, and because all oscillations of the bogie frame in a longitudinal direction take place about an axis which passes through the pivot of the cross member 4 and through the ball joint 15.—(*Accepted April* 30, 1935.)

No. 428,966. Draw and Buffing Gear

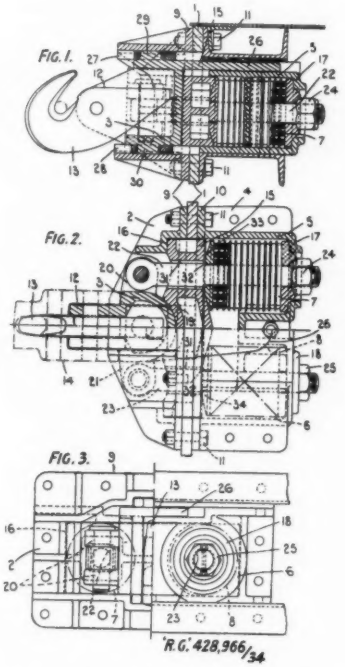
A. Spencer and George Spencer Moulton & Co. Ltd., both of 2, Central Buildings, London, S.W.1. April 14, 1934.

A central buffing and drawgear for railway vehicles comprises a housing mounted on the end sill of the vehicle, a pivoted draw head slidable in said housing, transversely projecting lugs on the draw head, rearwardly extending draw rods pivoted to the lugs, and two columns of springs mounted within the housing and actuated by the draw rods. At 1 is the end sill of the vehicle, to which is secured the main casting, which is in two parts, namely, a forwardly projecting housing 2 for the draw head 3 and a rearwardly projecting portion 4 providing cylindrical housings 5 and 6 for buffing and draw springs 7 and 8. At its rear, the casting 2 is furnished with a flange 9; the front of the housing 4 is similarly

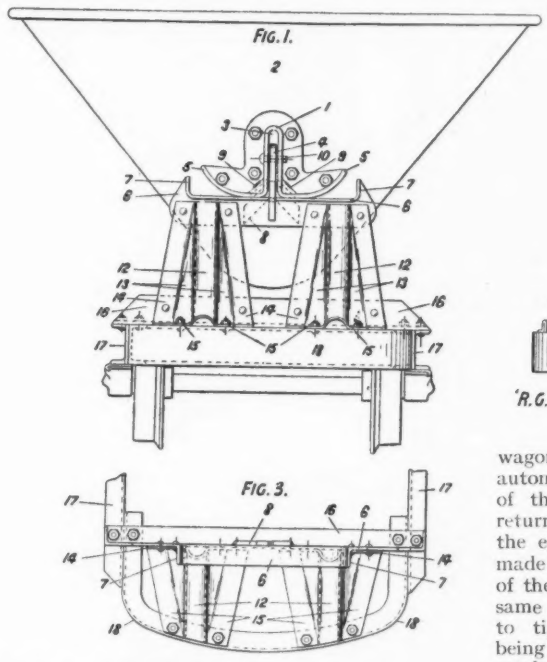
* These abridgments of recently published specifications are specially compiled for THE RAILWAY GAZETTE by permission of the Controller of His Majesty's Stationery Office. Group abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, either sheet by sheet as issued, on payment of a subscription of 5s. a group volume, or in bound volumes, price 2s. each, and the full specifications can be obtained from the same address price 1s. each

furnished with a flange 10. Bolts 11 passing through these flanges and through the interposed end sill serve to mount the gear. The construction illustrated is especially suited for use as a transition or conversion coupling, the draw head 3 for this purpose being slotted and formed with a pair of lugs 12 pivotally to mount the usual hook 13 or alternatively rigidly to carry the shank 14 of a central coupler.

The rear wall of the draw head 3 is formed cylindrical and extending transversely within the casting in front of the springs 7 and 8 is a front follower in the form of a hollow casting 15, the forward movement of which is limited by an inwardly directed flange 16 on the front of the casting 2. Rearward movement of the follower 15 compresses the springs 7 and 8 against stops constituted by annular flanges 17 and 18 forming the rear extremity of the cylindrical housings 5 and 6. The central part of the hollow casting 15 is



formed as a wall 19 co-operating with the cylindrical rear face of the draw head 3 to centralise this latter member while permitting it to rotate axially to accommodate movement of the coupler head. At each side of the draw head 3 are transversely projecting lugs 20 and 21 pivotally mounting draw rods 22 and 23, which pass rearwardly from said lugs through apertures in the front follower 15 and through the respective springs 7 and 8 to mount at their rear ends nuts 24 and 25, through which compression of the springs is effected to cushion draft shocks. The draw head is also formed with a rearwardly extending horizontal web 26 bearing on the rear portion 4 of the casting to eliminate any tendency of the head to rock either when buffing or drawing, and the upper and lower walls of the frontal portion 2 of the casting are stepped at 27 and 28 to form guideways in which ride upper and lower guide lugs 29 and 30 on said draw head. On draw, the springs are subjected to compression by the nuts



24 and 25, and the rear followers are drawn forwardly by means of the draw rods 22 and 23, the draw head 3 leaving the front follower 15. On buff, the latter is forced rearwardly by the cylindrical portion of the draw head 3 and thus compresses the springs against the stops 17 and 18, so that under all conditions of operation shocks are effectively cushioned.—(*Accepted May* 22, 1935.)

No. 429,578. Railway Tip Wagons

W. S. Hudson and P. Hudson, both of Raletrux House, Meadow Lane, Leeds, Yorks. February 21, 1935.

Means for supporting the body of a railway tip wagon comprise a trunnion so constructed that a central space, adapted to house a catch, is formed intermediate of two wings, partly flat and partly curved, arranged to rock about a stand top provided with a body-centring member that co-operates with joggled regions in the trunnion. At 1 is the approximately horseshoe-shaped intermediate portion of the trunnion at one end of the body 2; 3 is the space housing the catch 4 used to hold the body against tipping, and 5 are the wings about which tipping can take place when the catch is released. The platform or stand top 6 upon which the trunnion can rock is, like the trunnion itself, formed of a bar of angle section having upturned ends 7, and a plate 8, shaped as shown in Fig. 1, is welded to the vertical web of the top 6, the arrangement being such that the apex of the plate 8 is received by pockets or recesses formed in the trunnion as by joggling at the regions 9. The catch 4 which is pivoted to the trunnion at 10 has an edge portion 11 which is eccentric to the pivotal axis so that although the catch after tipping of the wagon may be free to engage automatically the underside of the top 6 as the body returns to normal position, the eccentric portion can be made to engage the end plate of the body 2 by forcing the same upwardly when about to tip the wagon, friction being sufficient to hold the catch thus in release position. The stand top 6 is carried by two supports pressed to the shape shown, that is to say with a rib 12 curved in cross sectional shape and merging, by way of triangular side walls 13, into vertical flanges 14 and horizontal flanges 15, the inclinations of the several regions being such as to impart considerable strength and rigidity to the support. The supports are riveted to the stand top 6 and to a stand foot angle 16, which angle 16 and supports are in turn removably secured to the frame channels 17, 18 of the vehicle frame.—(*Accepted* May 31, 1935.)

COMPLETE SPECIFICATIONS ACCEPTED

425,827. C.M. & M. (1929) Limited, Inman, H. S., and Speight, H. Steam traps.

425,865. British Doby Stokers Limited, and Christopher, H. Mechanical stokers.

426,447. Peyinghaus, W. (trading as Eisen-U Stahlwerk W. Peyinghaus). Lubrication of axle bearings for rail vehicles.

426,536. Machinenfabrik Augsburg-Nürnberg Akt. Ges. Internal combustion locomotives with electrical power transmission.

426,581. Kershaw, A. G., Leech, K. H., and Westinghouse Brake & Saxby Signal Co. Ltd. Slack-adjusting devices for fluid-pressure braking apparatus.

426,870. Naamlooze Vennootschap Machinerieen-en Apparaten Fabrieken Meaf. Level-crossing signalling arrangements.

XUM

CONTRACTS AND TENDERS

The Metropolitan-Cammell Carriage & Wagon Co. Ltd. has received an order from the Buenos Ayres Western Railway for a quantity of metalwork required for the construction abroad of 100 cattle wagons.

Diesel Locomotive and Railcar Orders

The Drewry Car Co. Ltd. has received a further repeat order from the Eagle Oil & Shipping Co. Ltd., for one narrow gauge diesel-engined locomotive. A Gardner L2 diesel engine, of the type fitted to all the other Drewry locomotives already in service on this company's oil fields in Mexico, will be employed and, on this occasion, the Wilson-Drewry epicyclic transmission will be used in conjunction with a Vulcan-Sinclair rigid traction type hydraulic coupling.

The Drewry Car Co. Ltd. has also in hand a diesel-engined passenger railcar, with Gardner L.W. engine and Wilson-Drewry epicyclic transmission, to the order of the War Office. Recent orders completed include saloon inspection railcars for the South African Railways and Harbours Board, and on August 26, final trials were carried out of a special railcar for the Ministry of Transport.

An Important Coal and Metal Contract

From Montevideo comes the news that a contract has been signed between the management of the National Electrical Power Houses and Telephones and Señores Pimental & Ferrari, the representatives of the Evans Reid Coal Co. Ltd., who, in combination with the British Metal Corporation, undertake to supply 100,000 tons of steam coal in exchange for copper and lead ore extracted from the mines worked by the State concern mentioned. The coal is intended for use in the National Power Houses during the year 1936, and the amount involved is about £120,000 sterling. It is also stated that other contracts are pending for the sale of iron ore to Great Britain, manganese to the U.S.A., and various other minerals to Italian and Japanese firms.

L.M.S.R. Contracts

The L.M.S.R. has placed an order with Vickers-Armstrongs Limited for the installation of Erith-Roe mechanical stokers to two boilers on each of the Heysham and Belfast steamers *Duke of Argyll* and *Duke of Rothesay*. The contract includes the fitting of Vortex grit arresters to the funnels. A contract has also been placed with Mather & Platt Limited, for the provision and fitting of Grinnell automatic sprinkler and fire-alarm systems on these two vessels and on the Larne and Stranraer steamer *Princess Margaret*.

J. Stone & Co. Ltd. has received an order for ten complete sets of electric train-lighting equipment for passenger coaches for the Leopoldina Railway.

The Chief Controller of Stores, Indian Stores Department, Simla, has placed the following orders, at the prices named :—

Jessop & Co. Ltd. : 136 steel tyres. (Rs. 13,802).
William Jacks & Co. : 164 steel locomotive tyres (Rs. 12,644).
Shaw Wallace & Co. Ltd. : 500 steel wagon tyres (Rs. 34,063).
Krupp Indian Trading Co. Ltd. : 678 wheel centres (Rs. 24,036) and 600 bearing springs (Rs. 15,979).
United Steel Cos. Ltd. : 1,166 steel locomotive tyres (Rs. 1,21,684).
Chloride Electrical Storage Co. Ltd. : nine sets train lighting batteries (Rs. 23,679).

Beyer-Garratt Locomotive for Australia

Beyer, Peacock & Co. Ltd. has received an order from the Australian Portland Cement Proprietary Limited for one Beyer-Garratt locomotive similar to the type supplied by Beyer, Peacock & Co. Ltd. to the Western Australian Government Railways. The locomotive is for the 3-ft. 6-in. gauge, with 2-6-0 + 0-6-2 wheel arrangement, and will have a maximum axle load of 9½ tons.

Permanent Way and Rolling Stock for Chilean State Railways

Information from Chilean sources is to the effect that the State Railways Administration has placed an order in Germany for rails to the value of 15,000,000 pesos (approximately equivalent at current exchange rates to £156,871) for renewals to the permanent way between Santiago and Puerto Montt, a distance of 671 miles. It is stated that a representative of the State Railways is proceeding to Germany for the purpose of taking over this material together with locomotives and coaches to a total value of 400,000,000 pesos (approximately £4,183,225).

Geo. Spencer Moulton & Co. Ltd. has received an order for approximately 6,000 indiarubber concentric springs for the Buenos Ayres Western Railway.

Linley & Co. Ltd. has received an order from the Madras & Southern Mahratta Railway Administration, to the inspection of Messrs. Rendel, Palmer & Tritton, for 36 copper fireboxes.

Alfol Insulation Limited has received an order for sets of Alfol insulation required for 400 containers for meat traffic which the L.N.E.R. is constructing at Faverdale shops.

Steam Breakdown Crane for India

Cowans, Sheldon & Co. Ltd. has received an order from the South Indian Railway Administration, to the inspection of Messrs. Robt. White & Partners, for one travelling steam breakdown crane with relieving bogies and match truck for metre-gauge service. The crane is designed to handle 35-ton loads at 18 ft. packed up.

The South Indian Railway Administration has also placed orders to the inspection of Messrs. Robt. White & Partners, with the Premier Steel Tube Co. Ltd. for 11,750 solid-drawn steel boiler tubes, and with Stahl Union Export G.m.b.H. for 1,800 volute buffer and drawbar springs.

The Bambairtite Battery Co. Ltd., has received the following orders :—

For Madras & Southern Mahratta Railway : spares for No. 2 size patent cells comprising 1,050 glass jars, 1,263 glass lids, 1,011 rubber plugs, and 932 joint rings ; and for the South Indian Railway : 800 No. 1 (3-pint) Bambairtite patent cells complete.

A. B. Svenska Kullagerfabriken has received an order for 1,048 roller-bearing axleboxes for passenger coaches from the Swedish State Railways. This railway administration is now using over 29,800 roller-bearing boxes. An order has been received from the Egyptian State Railways for 120 boxes for 20 locomotive tenders, and other orders include the supply of 288 axleboxes for passenger coaches for the P.O.-Midi Railways, and of 414 bearings for boxes for the New South Wales Government Railways. SKF has also equipped two high-speed streamlined locomotives for the Chicago, Milwaukee, St. Paul & Pacific Railroad with roller-bearing boxes on the driving axles and leading bogie axles.

New Nile Bridge, Upper Egypt

The Egyptian State Railways Administration invites tenders, receivable at the General Management, Cairo, by October 31, for the supply of materials and work connected with the construction of a new railway bridge over the Nile at Naga-Hamadi, Upper Egypt, and the demolition of the existing bridge. The new bridge is to include six 65-in. fixed spans and a 58-in. swing span, and will require approximately 1,500 tons of rolled steel, 85 tons of cast steel, forged steel, bronze, &c.

Carriage Underframes Required

The Egyptian State Railways Administration is calling for tenders, receivable at the General Management, Cairo, by November 16, for a number of bogie passenger-coach underframes with roller-bearing fitted bogies.

W. H. Bramall & Co. Ltd. has appointed Mr. W. Kelway-Bamber, 8, The Sanctuary, Westminster, S.W.1 ('phone Abbey 3859) as London representative for the sale of this firm's products, including pressure gauges, testers, electrical instruments, thermometers, gunmetal fittings and valves.

FOG WARNINGS FOR PASSENGERS.—The L.N.E.R. is to continue this winter the telephone service inaugurated last year whereby certain London suburban exchanges are notified of train arrangements in foggy weather, and passengers can therefore ascertain how services are running before leaving home. In the coming winter the facility, hitherto operative only until 10 a.m., will be extended so that queries received after this hour may be fully dealt with.

OFFICIAL NOTICES

Bengal-Nagpur Railway Company Limited

THE Directors are prepared to receive Tenders for :—

ONE 40-TON ELECTRIC TRAVELLING CRANE.

Specification and Form of Tender can be obtained at the Company's Offices, 132, Gresham House, Old Broad Street, London, E.C.2, on or after Wednesday, 28th August, 1935.

A fee of 10s. will be charged for each copy of the specification, which is not returnable.

Tenders must be submitted not later than noon on Wednesday, 11th September, 1935.

The Directors do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
T. R. WYNNE,
Managing Director.

Ministry of Transport

APPLICATIONS are invited for a full-time pensionable appointment of Railway Employment Inspector on the staff of the Chief Inspecting Officer of Railways, Ministry of Transport, on the salary scale £600 : £25 : £800 a year with travelling expenses on usual scales.

Candidates should have practical experience in the management and operation of a British Railway with training as a mechanical engineer and locomotive running experience.

Applications, which should contain full particulars of age, education, technical training and experience, should be addressed to the Establishment Officer, Ministry of Transport, Whitehall Gardens, London, S.W.1, not later than 14th September.

Canvassing through Members of Parliament or in other ways will render a candidate liable to disqualification.

THE ASSAM-BENGAL RAILWAY COMPANY LIMITED is prepared to receive Tenders for :—

DOGSPIKES.

Specifications and Tender Forms may be obtained at the Offices of the Company, 56, Victoria Street, S.W.1. A fee of £1 1s. 0d. is charged for each specification, which cannot be returned.

Tenders must be delivered at the Company's Offices not later than 10 a.m. on Tuesday, the 17th September, 1935.

The Directors do not bind themselves to accept the lowest or any Tender.

By Order of the Board,
M. A. RICHARDSON,
Acting Secretary.

27th August, 1935.

South Indian Railway Company Limited

THE Directors are prepared to receive tenders for the supply of :—

FISHBOLTS AND NUTS.

Specifications and Forms of Tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1.

Tenders addressed to the Chairman and Directors of the South Indian Railway Company Limited, marked "Tender for Fishbolts and Nuts," with the name of the firm tendering, must be left with the undersigned not later than 12 noon on Friday, the 13th September, 1935.

The Directors do not bind themselves to accept the lowest or any tender.

A charge, which will not be returned, will be made of 2s. 6d. for each copy of the Specification.

Copies of the drawings may be obtained at the Offices of the Company's Consulting Engineers, Messrs. Robert White & Partners, 3, Victoria Street, S.W.1.

E. A. S. BELL,
Managing Director.

91, Petty France,
Westminster, S.W.1.
28th August, 1935.

G.W.R. Centenary Celebrations

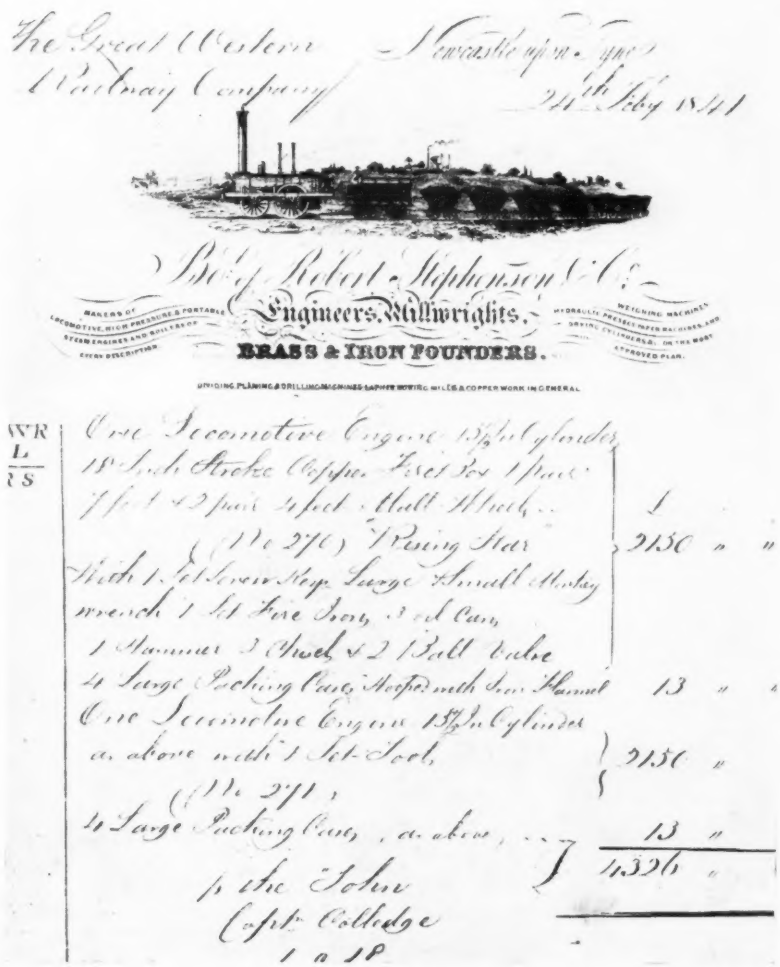
To celebrate the centenary of the inception of the company, the Great Western Railway has arranged the following events :—

Today (August 30) a broadcast has been arranged in conjunction with the B.B.C. It will be relayed in the National programme between 8 and 9 p.m. and will take the form of a journey from Paddington to Penzance. A number of G.W.R. officials and employees will take part in the broadcast, which will tell of the foundation, growth, and history of the railway.

To commemorate the association of the City of Bristol with the incorporation of the G.W.R., a luncheon is to be held tomorrow (Saturday) in the Great Hall of Bristol University to which over 350 guests have been invited. Sir Robert Horne, Chairman of the G.W.R. will take the chair, and will be supported by other directors of the company. The guests will include the Lord Mayor of Bristol; the Rt. Hon. J. H. Thomas, Secretary of State for the Dominion Affairs; the Marquess of Bath, Lord Lieutenant of Somerset; Members of Parliament for Bristol constituencies; Members of the City Council and Society of Merchant Venturers, the two bodies which played such a prominent part in the promotion of the company; other civic dignitaries and representatives of the commercial and industrial interests of Bristol and District; and also descendants of those who were engaged in the formation of the company. Guests from London will travel by special train leaving Paddington at 10.0 a.m. and will return from Bristol at 4.30 p.m. After the luncheon a railway cavalcade of the past 100 years will be shown in a unique way to the company's guests by means of a sound film which has been specially produced to mark the centenary.

Both Paddington and Bristol Stations, the original termini of the G.W.R., are specially decorated.

On October 30 a banquet is to be held at Grosvenor House, Park Lane, London, at which his Royal Highness the Prince of Wales has consented to be present, when the company's centenary film will again be shown.


The Great Western Railway Company
Newcastle upon Tyne
24th Feby 1841
Robt. Stephenson & Co.
Engineers, Millwrights,
BRASS & IRON FOUNDERS.
MAKERS OF LOCOMOTIVE, HIGH PRESSURE & PORTABLE STEAM ENGINES AND BOILERS OF EVERY DESCRIPTION
WEIGHING MACHINES
HYDRAULIC PRESSES, PUNCHING MACHINES AND DRIVING CYLINDERS &c. ON THE MOST APPROVED PLAN.
DIVIDING, PLANING & DRILLING MACHINES, SAPHER WORK, MILLS & COPPER WORK IN GENERAL
GWR
L
S
One Locomotive Engine 15½ Cylinder
18 Inch Stroke Copper Fixed for 4 Pair
of 5 feet 2 Pair 6 feet Hall Wheels
(No 270) Rising Star
with 1 Set Screw Key Large Shovel Mashay
wrench 1 Set Fire Iron, 3 Oil Cans
1 Hammer 3 Steel & 2 Ball Valve
4 Large Packing Cases Hooped with Iron Flannel
One Locomotive Engine 15½ Cylinders
as above with 1 Set Tools
(No 271)
4 Large Packing Cases as above
1
2150 " "
13 " "
2150 "
13 "
4326 "
per the John
Capt. Coltridge
1 a 18

Invoice for an early G.W.R. locomotive

Railway Share Market

Stock and share markets have been influenced by the uncertainty of the outcome of the Italo-Abyssinian crisis, but as far as concerns home securities, such as home railway stocks, there is still only a reflective effect. No one imagines for one moment that home railway stocks would be directly affected by the outbreak of actual warfare in Abyssinia.

It becomes more than ever necessary to take the long view about prospects, but as quotations for the four principal ordinary stocks are now down to the lowest level of last year there is justification for the view that the trend is in favour of the investor who is prepared to hold on for a year or two. Southern deferred ordinary stock was to be bought this week at around 19, which is the lowest price for the last two years and compares with over 32 touched in 1934. There is no appreciable difference in the position of the railway, apart from restoration of part of the wages "cut," against which may be put the prospect of an increasing traffic return from the newly electrified sections of the railway, whilst if the new assessment is upheld in the House of Lords the saving is estimated to be equivalent to just over one per cent. on the preferred ordinary stock. This stock is already earning in current traffic receipts two-thirds of the amount required to pay the full 5 per cent. dividend. London & North Eastern issues are more speculative because they depend on sustained recovery of the iron and steel industry and the creation of new industries in the north-eastern areas, all of which may take much time. The 4 per cent. first preference stock is regarded as the more attractive, and among the L.M.S. issues the 1923 preference stock is first favourite.

Foreign railways have been weak, with Argentine stocks reactionary. The ordinary stocks of the four chief companies are now at the lowest prices ever recorded. Buenos Ayres Great Southern ordinary changed hands at below 19, against over 100 in 1930, B.A. Western ordinary at under 15, against 83½ in 1930, Central Argentine ordinary at 10½, against nearly 90 in 1930, and B.A. Pacific ordinary at around 7, against over 90 in 1930. Despite the change in conditions since 1930, the scope for recovery in capital value is still remarkably large.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1934-35	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1934	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1934	Prices: Lowest 1934	Prices: Aug. 28, 1935	Yield % (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili) & Bolivia	830	25.8.35	11,730	— 8,960	34	417,620	470,990	— 53,370	Ord. Stk.	26⅝	19	19	Nil
	Argentine North Eastern	753	24.8.35	9,014	+ 372	8	64,407	63,024	+ 1,383	,,	11	6⅞	6	Nil
	Argentine Transandine	111	—	—	—	—	—	—	—	A. Deb.	52	45	48	85/16
	Bolivar	174	July, 1935	5,300	+ 200	30	44,700	43,850	+ 850	6 p.c. Deb.	10	6½	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	13⅝	10 7/16	13	3 15/16
	Buenos Ayres & Pacific	2,806	24.8.35	71,756	+ 1,704	8	578,159	562,667	+ 15,492	Ord. Stk.	16½	8½	7	Nil
	Buenos Ayres Central	190	3.8.35	$131,200	— $12,600	5	$621,300	$653,000	— $31,700	Mt. Deb.	23	10	16	Nil
	Buenos Ayres Gt. Southern	5,085	24.8.35	123,371	— 3,501	8	921,249	998,034	— 76,785	Ord. Stk.	35	22	19½	Nil
	Buenos Ayres Western	1,930	24.8.35	36,994	— 2,472	8	317,427	353,981	— 36,554	,,	27½	18½	15	Nil
	Central Argentine	3,700	24.8.35	114,298	— 21,268	8	955,222	1,052,320	— 97,098	,,	23	13½	11	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	14	7	6	Nil
	Cent. Uruguay of M. Video	273	24.8.35	7,758	— 8,511	8	66,568	131,786	— 65,218	Ord. Stk.	15½	3	4½	Nil
	Do. Eastern Extn.	311	24.8.35	1,359	—	8	10,542	11,435	— 893	—	—	—	—	—
	Do. Northern Extn.	185	24.8.35	884	+ 58	8	8,630	6,721	+ 1,909	—	—	—	—	—
	Do. Western Extn.	211	24.8.35	834	+ 221	8	5,370	4,595	+ 775	—	—	—	—	—
	Cordoba Central	1,218	24.8.35	33,650	+ 2,370	8	269,920	278,870	— 8,950	Ord. Inc.	6	3	2	Nil
	Costa Rica	188	30.6.35	15,519	— 4,778	52	191,757	218,120	— 26,363	Stk.	30⅝	23½	34	5⅞
	Dorada	70	July, 1935	13,600	+ 3,600	30	80,400	70,200	+ 10,200	1 Mt. Db.	103	95	102½	5⅞
	Entre Rios	810	24.8.35	12,983	+ 1,550	8	96,835	84,837	+ 11,998	Ord. Stk.	21½	12	9½	Nil
	Great Western of Brazil	1,082	24.8.35	4,900	— 1,100	34	252,300	255,500	— 3,200	Ord. Sh.	7⅛	5⅛	5⅛	Nil
	International of Cl. Amer.	794	June, 1935	$371,547	+ $118,226	26	$2,632,185	$2,719,993	— $87,808	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	1/-	1/-	1½	Nil
	La Guaira & Caracas	22⅝	July, 1935	3,725	— 730	30	27,570	25,890	+ 1,680	Stk.	12⅝	7⅝	8½	Nil
	Leopoldina	1,918	24.8.35	21,432	— 9,280	34	571,231	724,137	— 152,906	Ord. Stk.	14⅝	7	3½	Nil
	Mexican	483	21.8.35	$212,700	+ $4,300	8	$1,785,100	$1,654,100	+ $131,000	,,	3¼	1½	½	Nil
	Midland of Uruguay	319	July, 1935	5,218	— 4,243	4	5,218	9,461	— 4,243	,,	1½	½	1½	Nil
	Nitrate	401	15.8.35	4,805	— 506	32	93,610	90,541	+ 3,069	Ord. Sh.	32 2/32	51/-	2⅝	Nil
	Paraguay Central	274	17.8.35	$2,199,000	+ $1,254,000	7	$11,967,000	$6,833,000	+ $5,134,000	Pr. Li. Stk.	84	67	77½	7⅝
	Peruvian Corporation	1,059	July, 1935	73,813	+ 21,196	4	73,813	52,617	+ 21,196	Pref.	14½	8	8½	Nil
	Salvador	100	17.8.35	¢10,795	+ ¢2,776	7	¢88,436	¢71,787	+ ¢16,649	Pr. Li. Db.	75	70	65	7 11/16
	San Paulo	153½	18.8.35	25,576	+ 31	33	845,153	911,823	— 66,670	Ord. Stk.	86	67	38½	6½
	Taltal	164	July, 1935	2,525	— 103	4	2,525	2,628	— 103	Ord. Sh.	2⅛	1 7/16	1½	6 11/16
	United of Havana	1,365	24.8.35	17,046	— 3,920	8	147,976	143,210	+ 4,766	Ord. Stk.	6	2	2	Nil
	Uruguay Northern	73	July, 1935	612	— 444	4	612	1,056	— 444	Deb. Stk.	6¼	3	4½	Nil
Canada.	Canadian National	23,714	21.8.35	627,977	+ 41,998	33	20,855,866	20,427,117	+ 428,749	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	— 4 p.c.	Prep. Dbs.	78¼	51½	55½	7 5/16
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	104½	97¼	100½	4
	Canadian Pacific	17,211	21.8.35	477,600	+ 11,400	33	14,945,200	14,982,000	— 36,800	Ord. Stk.	18 5/16	11 1/16	10½	Nil
India.†	Assam Bengal	1,329	31.7.35	33,090	— 7,805	17	394,697	477,062	— 82,365	Ord. Stk.	88½	72	82½	3⅝
	Barsi Light	202	31.7.35	2,812	— 3,195	17	53,700	58,005	— 4,305	Ord. Sh.	10 4½	9 8¼	8 8½	6 3/16
	Bengal & North Western	2,114	10.8.35	57,609	+ 3,317	19	947,251	979,757	— 32,506	Ord. Stk.	29 7½	26 2	29 9½	5 5/16
	Bengal Dooars & Extension	161	31.7.35	4,028	— 946	17	40,595	45,575	— 4,980	,,	12 5¼	12 4	12 5½	5 9/16
	Bengal-Nagpur	3,268	20.7.35	158,550	+ 7,661	16	1,961,750	1,885,235	+ 76,515	,,	105 1/2	96	101 1/2	3 15/16
	Bombay, Baroda & Cl. India	3,072	20.8.35	166,950	— 375	20	3,076,950	3,092,925	— 15,075	,,	115	108 1/2	113 1/2	5 5/16
	Madras & South'n Mahratta	3,230	31.7.35	137,700	— 25,582	17	1,868,050	2,069,806	— 201,756	,,	131	122 3/4	122 1/2	7⅛
	Rohilkund & Kumaon	546	10.8.35	8,919	— 1,291	19	181,148	188,921	— 7,773	,,	26 3	25 0	29 2 1/2	5 1/8
	South India	2,526	31.7.35	113,609	— 1,156	17	1,397,048	1,418,478	— 21,430	,,	119	115	117 1/2	6 13/16
Various.	Beira-Umtali	204	June, 1935	56,051	— 1,046	38	576,265	456,945	+ 119,320	—	—	—	—	—
	Bilbao River & Cantabrian	15	July, 1935	1,129	— 1,393	30	11,034	12,982	— 1,948	—	—	—	—	—
	Egyptian Delta	622	17.8.35	6,090	— 118	19	70,235	71,386	— 1,151	Prf. Sh.	2 13/16	1¾	1¾	5 11/16
	Great Southern of Spain	104	17.8.35	1,893	— 338	33	57,669	68,158	— 10,489	Inc. Deb.	4	3½	3½	Nil
	Kenya & Uganda	1,625	July, 1935	180,643	+ 18,481	30	1,473,420	1,385,090	+ 88,330	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	50	33	41	8 9/16
	Mashonaland	913	June, 1935	102,039	— 7,073	38	1,047,960	840,132	+ 207,828	1 Mg. Db.	101	91¾	103½	4 15/16
	Midland of W. Australia	277	June, 1935	11,739	— 292	52	159,573	158,208	+ 1,365	Inc. Deb.	100	93	94½	5 5/16
	Nigerian	1,905	6.7.35	20,758	+ 1,452	14	351,725	355,578	— 3,853	—	—	—	—	—
	Rhodesia	1,538	June, 1935	182,536	— 1,260	38	1,723,519	1,418,680	+ 304,839	4 p.c. Db.	104 7/8	97 1/2	104	3 13/16
	South African	13,225	3.8.35	560,296	+ 29,037	18	9,749,422	8,819,911	+ 929,511	—	—	—	—	—
	Victorian	4,728	Apl., 1935	799,418	+ 68,999	43	7,962,662	7,716,599	+ 246,063	—	—	—	—	—
	Zafra & Huelva	112	July, 1935	11,227	+ 167	30	76,472	76,861	— 389	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value